2604

SUSITNA
HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION
PROJECT No. 7114

RESERVOIR/RIVER TEMPERATURES AND ICE SIMULATIONS

FOR WATANA ONLY OPERATING IN 2001

VOLUME 5 - APPENDIX G

Final Report

February 1985
Document No. 2604

HARZA-EBASCO
SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

Document No. 2604
Susitna File No. 6.1B.7.5

SUSITNA HYDROELECTRIC PROJECT

RESERVOIR/RIVER TEMPERATURES AND ICE SIMULATIONS

For Watana Only Operating In 2001

VOLUME 5 - APPENDIX G

Report By
Harza-Ebasco Susitna Joint Venture

Prepared for
Alaska Power Authority

Final Report
February 1985

Appendix G

SUSITNA HYDROELECTRIC PROJECT

Reservoir/River Temperatures and Ice Simulations

For Watana Only Operating, 2001

o Exhibits (8)

Appendix G

SUSITNA HYDROELECTRIC PROJECT

LIST OF EXHIBITS

Exhibit G-1

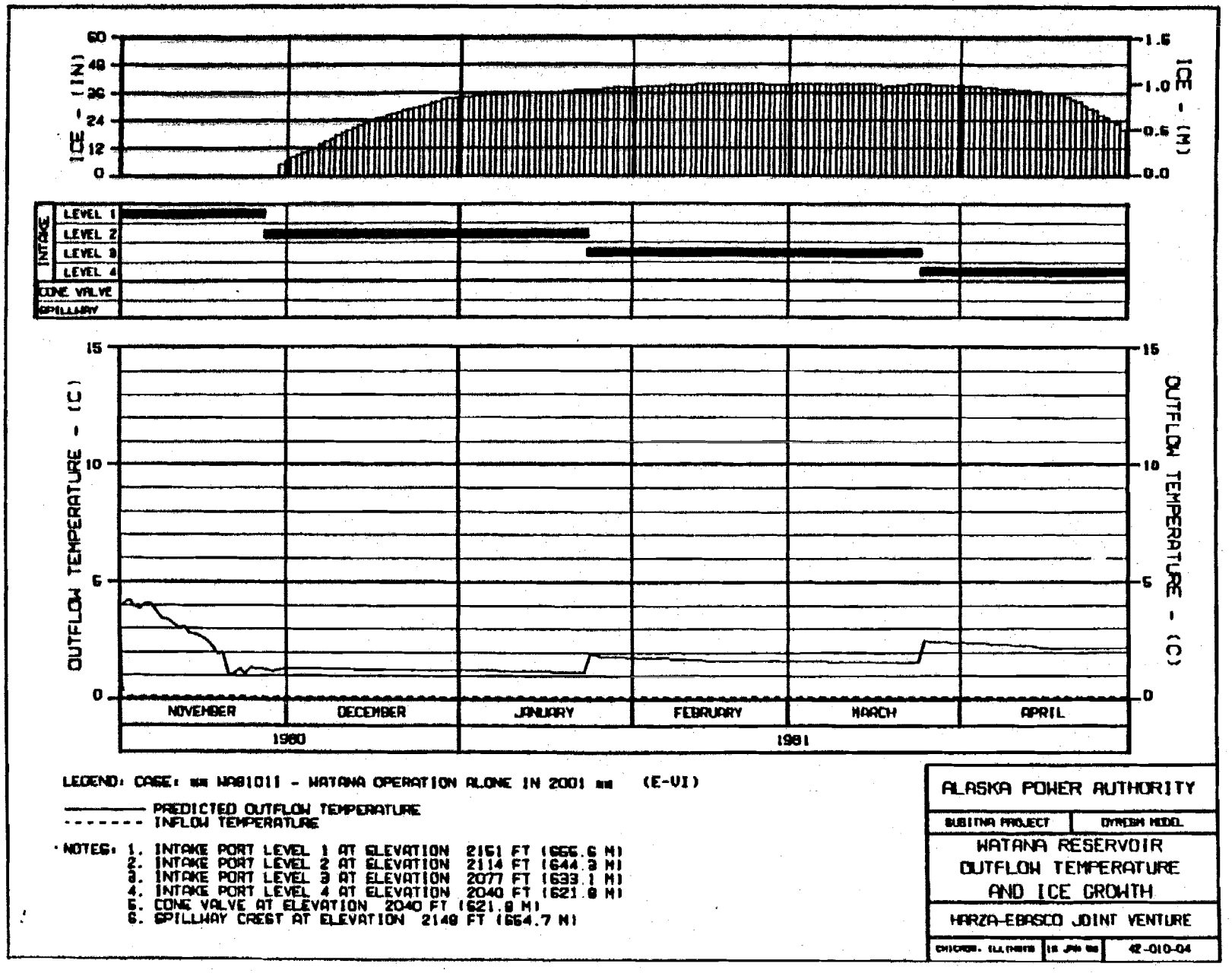
CASE E-VI RESERVOIR TEMPERATURE SIMULATIONS

FOR

PROJECTED ENERGY DEMANDS - YEAR 2001

- Outflow Temperature and Ice Growth Curves (3)
- Temperature Profiles (8)

Note: Simulations are based on hydrologic and meteorologic data from the period November 1980 to September 1982.



LEGEND: CASE: WA81011 - WATANA OPERATION ALONE IN 2001 (E-VI)

——— PREDICTED OUTFLOW TEMPERATURE
- - - - - - - INFLOW TEMPERATURE

NOTES:
1. INTAKE PORT LEVEL 1 AT ELEVATION 2151 FT (655.6 M)
2. INTAKE PORT LEVEL 2 AT ELEVATION 2114 FT (644.3 M)
3. INTAKE PORT LEVEL 3 AT ELEVATION 2077 FT (633.1 M)
4. INTAKE PORT LEVEL 4 AT ELEVATION 2040 FT (621.8 M)
5. CONE VALVE AT ELEVATION 2040 FT (621.8 M)
6. SPILLWAY CREST AT ELEVATION 2149 FT (654.7 M)

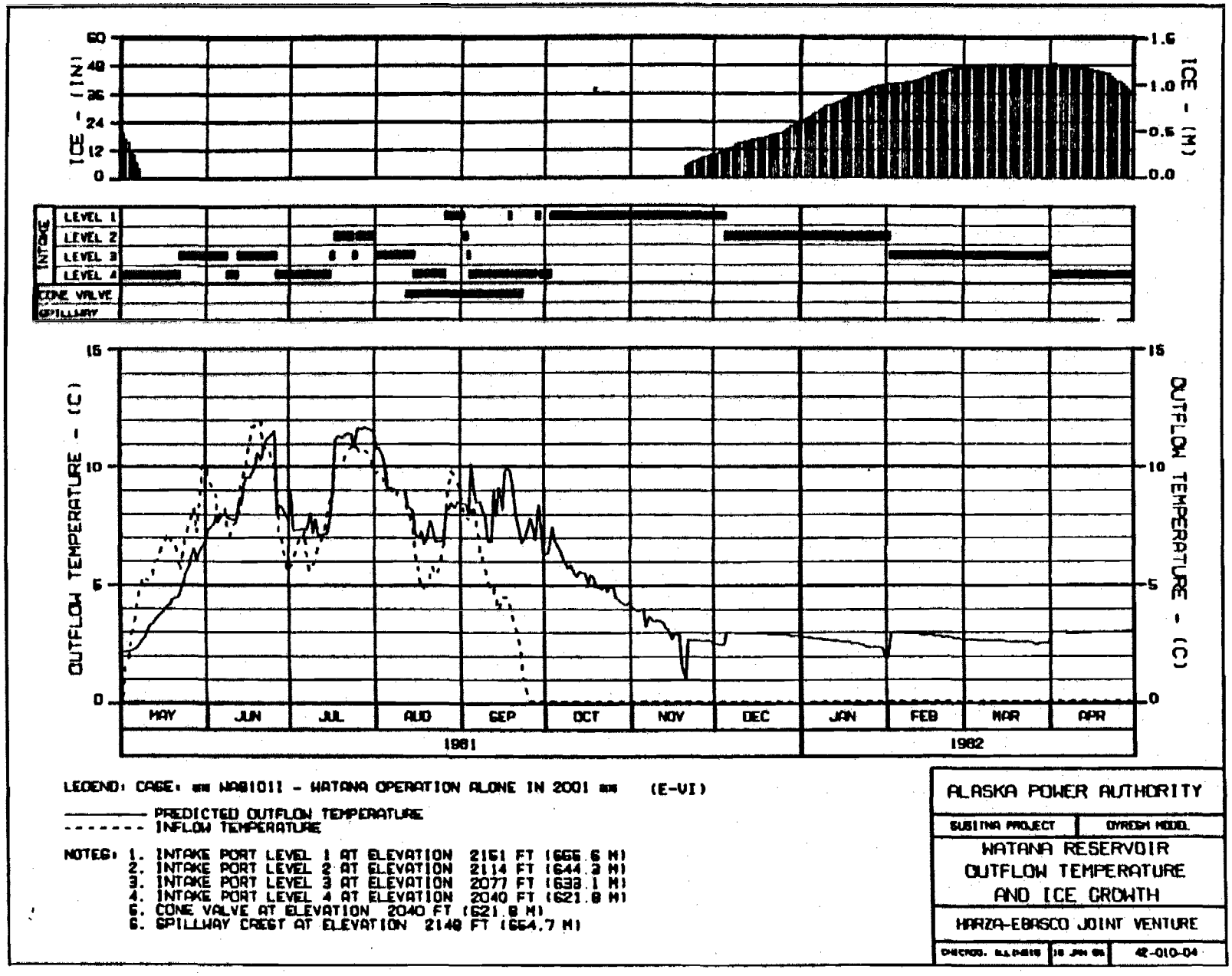
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DYNSIM MODEL

WATANA RESERVOIR
OUTFLOW TEMPERATURE
AND ICE GROWTH

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 15 JAN 82 | 42-010-04



LEGEND: CASE: WAB1011 - WATANA OPERATION ALONE IN 2001 (E-VI)

——— PREDICTED OUTFLOW TEMPERATURE
- - - - - - - INFLOW TEMPERATURE

NOTES:
1. INTAKE PORT LEVEL 1 AT ELEVATION 2151 FT (655.6 M)
2. INTAKE PORT LEVEL 2 AT ELEVATION 2114 FT (644.3 M)
3. INTAKE PORT LEVEL 3 AT ELEVATION 2077 FT (633.1 M)
4. INTAKE PORT LEVEL 4 AT ELEVATION 2040 FT (621.8 M)
5. CONE VALVE AT ELEVATION 2040 FT (621.8 M)
6. SPILLWAY CREST AT ELEVATION 2149 FT (654.7 M)

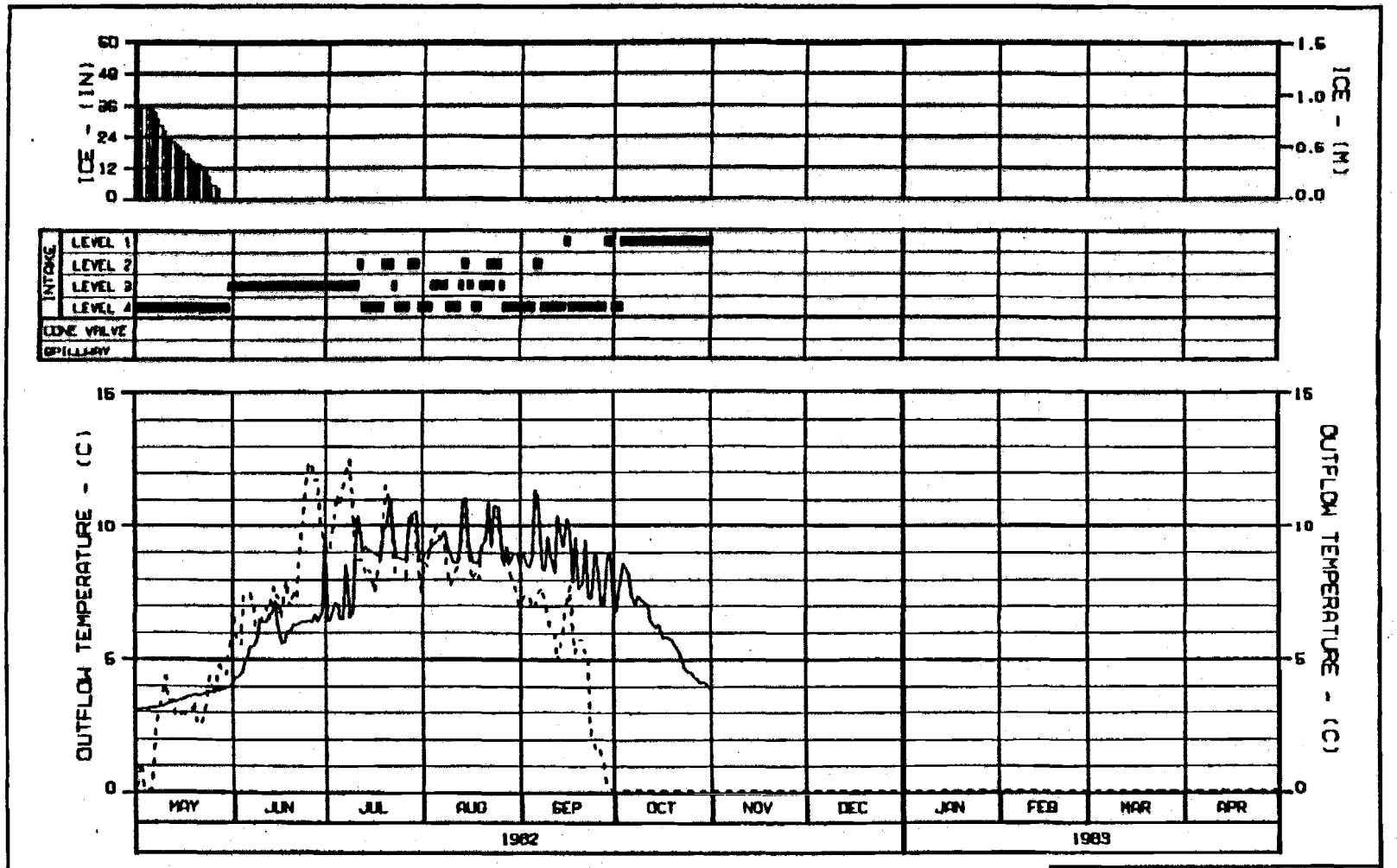
ALASKA POWER AUTHORITY

SUSITNA PROJECT	DYRESM MODEL

WATANA RESERVOIR
OUTFLOW TEMPERATURE
AND ICE GROWTH

HARZA-EBASCO JOINT VENTURE

[illegible]	18 JAN 85	42-010-04



LEGEND: CASE: WAB1011 - WATANA OPERATION ALONE IN 2001 (E-VI)

———— PREDICTED OUTFLOW TEMPERATURE
- - - - - - - INFLOW TEMPERATURE

NOTES:
1. INTAKE PORT LEVEL 1 AT ELEVATION 2161 FT (665.6 M)
2. INTAKE PORT LEVEL 2 AT ELEVATION 2114 FT (644.3 M)
3. INTAKE PORT LEVEL 3 AT ELEVATION 2077 FT (633.1 M)
4. INTAKE PORT LEVEL 4 AT ELEVATION 2040 FT (621.8 M)
5. CONE VALVE AT ELEVATION 2040 FT (621.8 M)
6. SPILLWAY CREST AT ELEVATION 2149 FT (654.7 M)

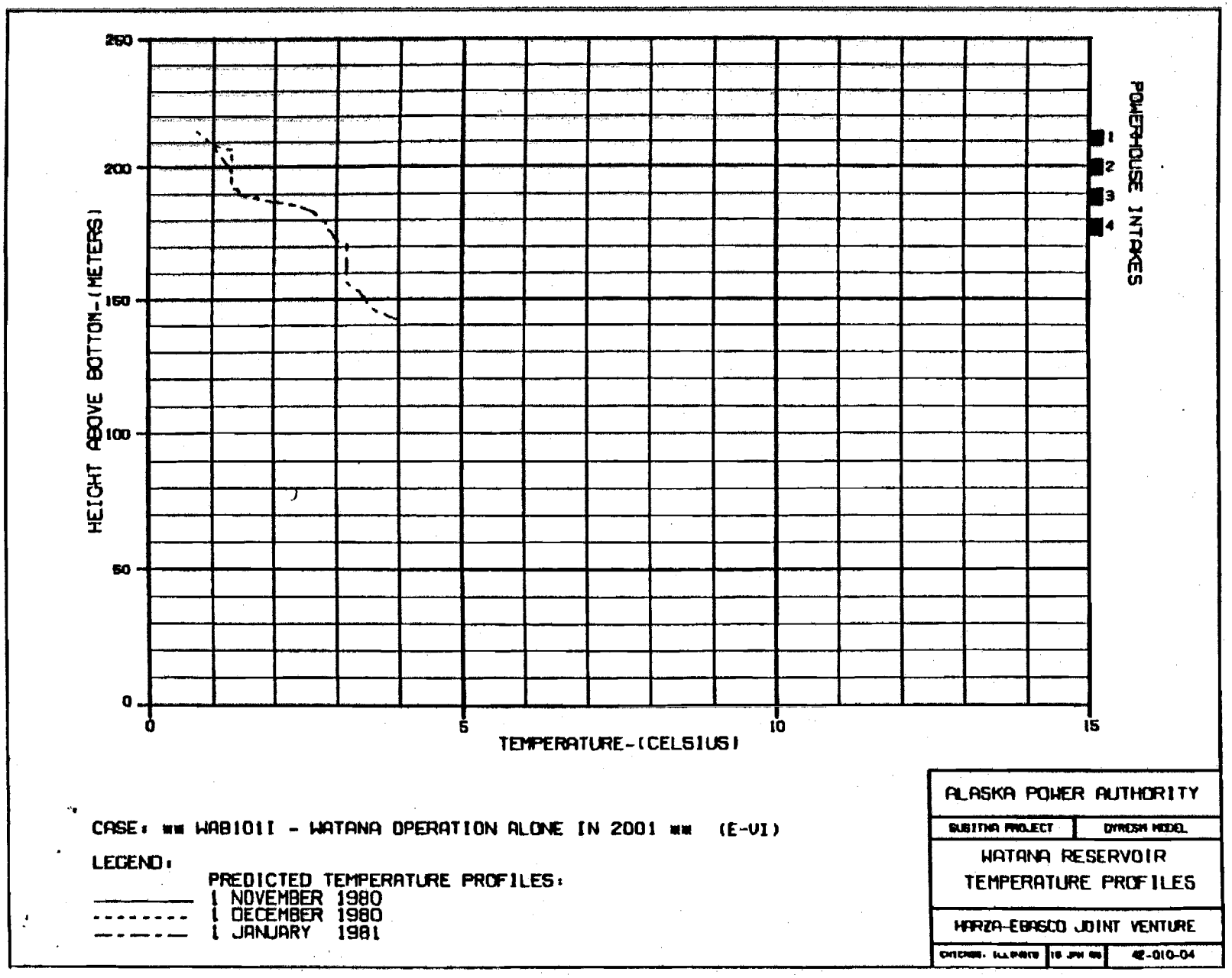
ALASKA POWER AUTHORITY

SUSITNA PROJECT	DYRESM MODEL

WATANA RESERVOIR
OUTFLOW TEMPERATURE
AND ICE GROWTH

HARZA-EBASCO JOINT VENTURE

CHECKED: R.L.PHELPS	18 JAN 88	42-010-04



CASE: ** WAB1011 - WATANA OPERATION ALONE IN 2001 ** (E-VI)

LEGEND:

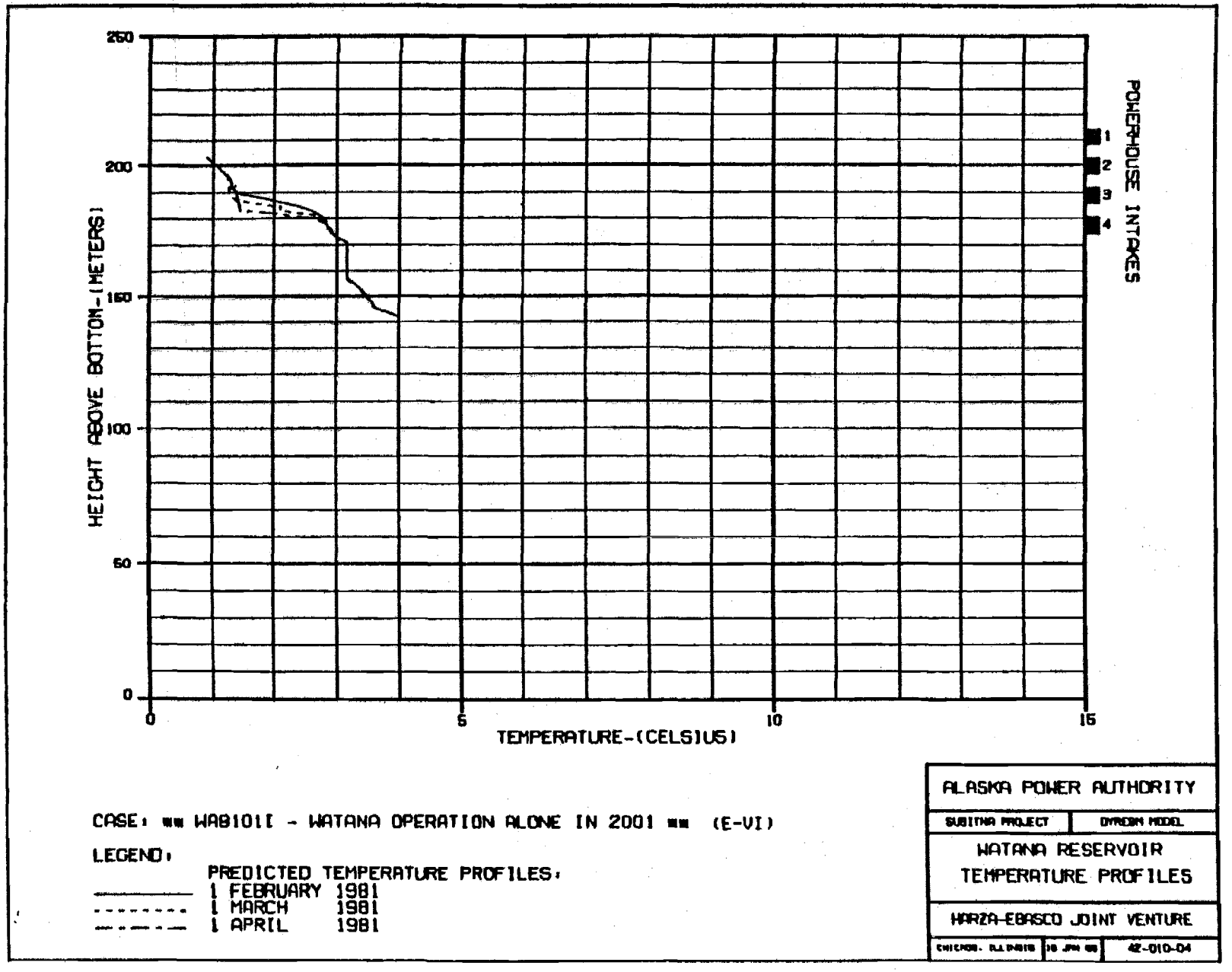
PREDICTED TEMPERATURE PROFILES:

———— 1 NOVEMBER 1980

- - - - - - - - 1 DECEMBER 1980

—— — — — 1 JANUARY 1981

ALASKA POWER AUTHORITY	
SUSITNA PROJECT	DYRESM MODEL
WATANA RESERVOIR TEMPERATURE PROFILES	
HARZA-EBASCO JOINT VENTURE	
CHICAGO, ILLINOIS	16 JAN 86	42-010-04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200
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0
HEIGHT ABOVE BOTTOM-(METERS)
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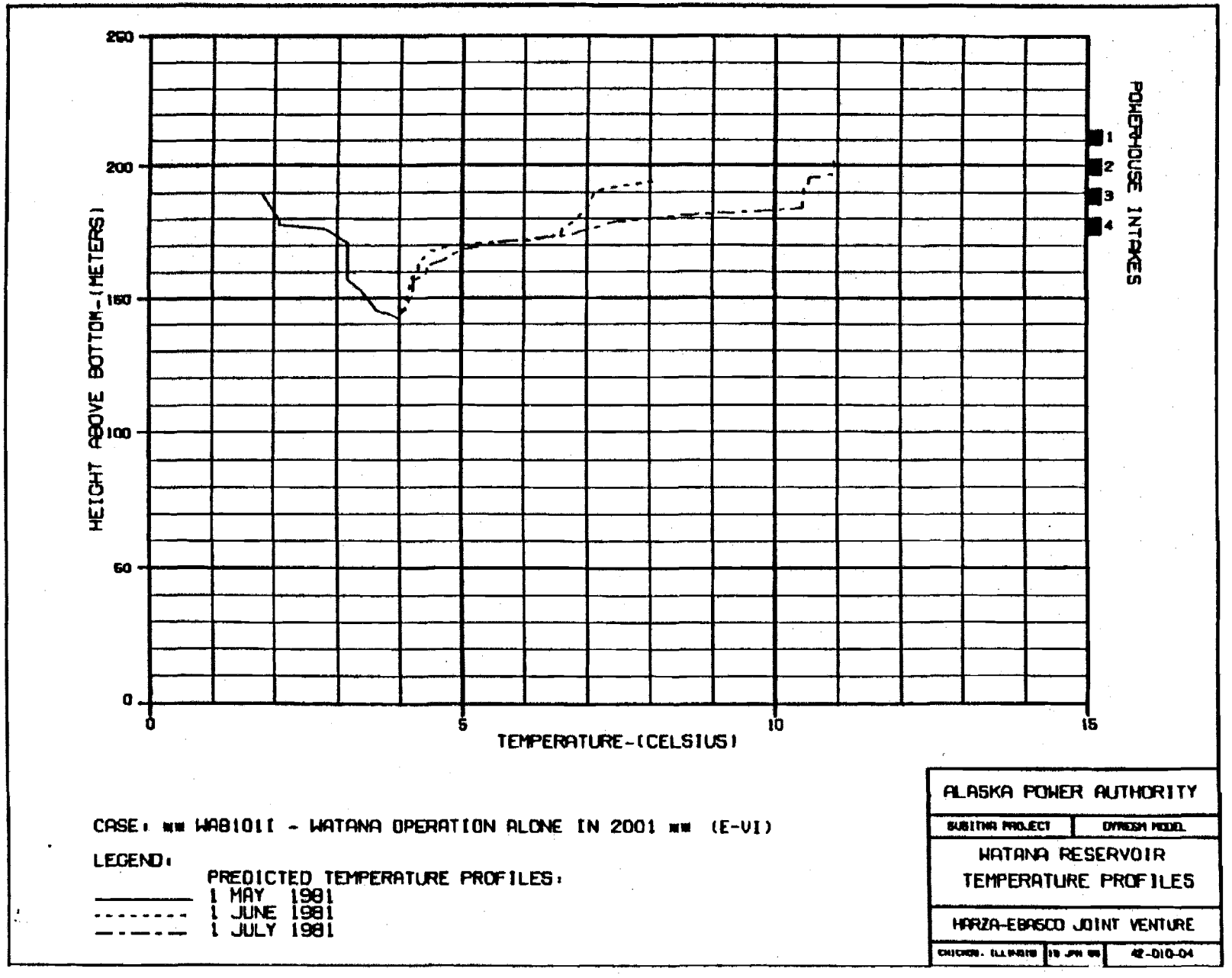
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WAB101[- WATANA OPERATION ALONE IN 2001 (E-VI)
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 FEBRUARY 1981
1 MARCH 1981
1 APRIL 1981
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DYRESM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
CHICAGO, ILLINOIS
JUN
42-010-04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200
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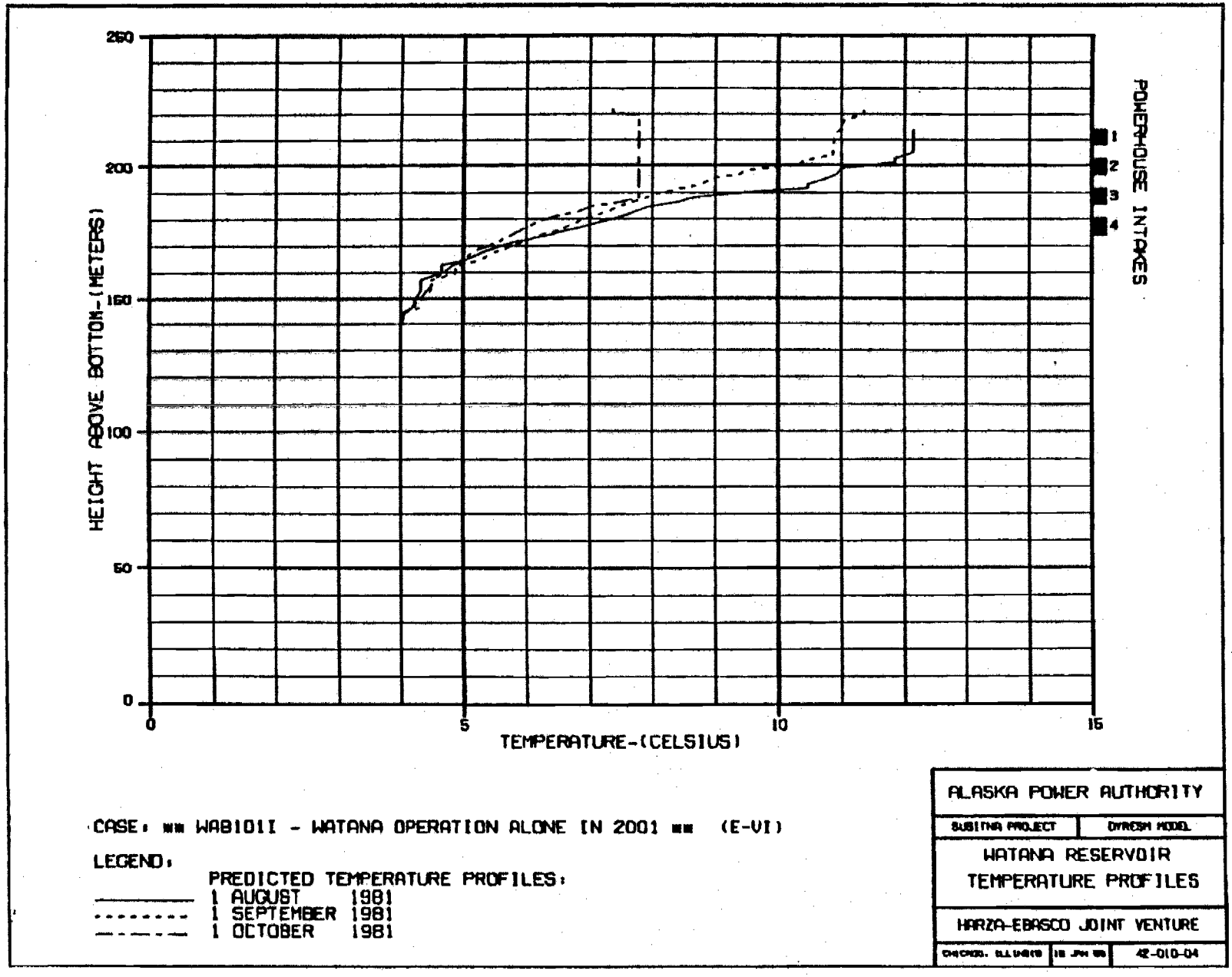
0
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WAB1011 - WATANA OPERATION ALONE IN 2001 (E-VI)
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 MAY 1981
1 JUNE 1981
1 JULY 1981
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DYRESM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
CHICAGO, ILLINOIS
42-010-04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HEIGHT ABOVE BOTTOM-(METERS)
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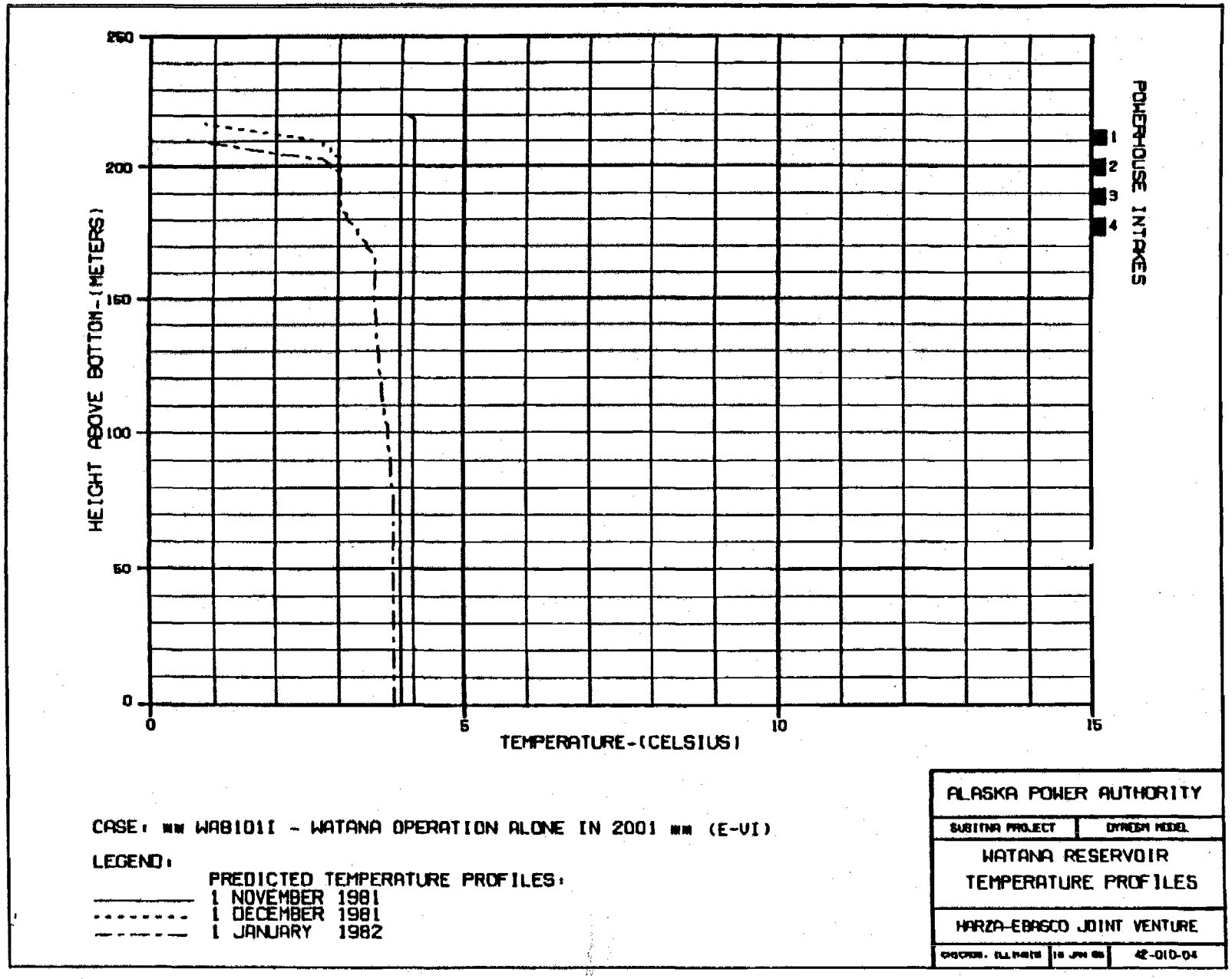
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WA81011 - WATANA OPERATION ALONE IN 2001 (E-VI)
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 AUGUST 1981
1 SEPTEMBER 1981
1 OCTOBER 1981
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DYRESM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
42-010-04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200
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HEIGHT ABOVE BOTTOM-(METERS)
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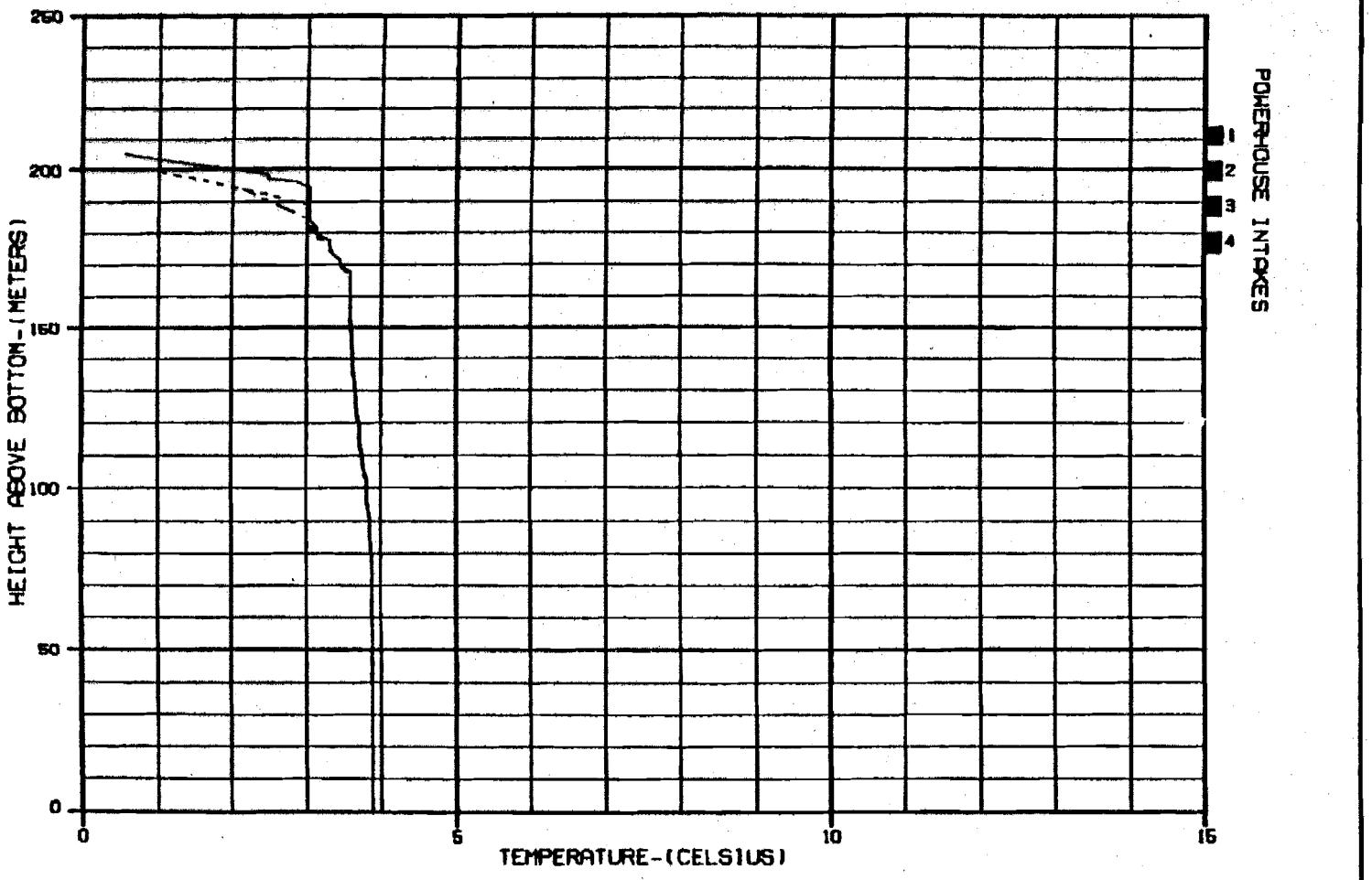
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WA81011 - WATANA OPERATION ALONE IN 2001 (E-VI)
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 NOVEMBER 1981
1 DECEMBER 1981
1 JANUARY 1982
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DYNSIM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
42-010-04



CASE: ** WAB101I - WATANA OPERATION ALONE IN 2001 ** (E-VI)

LEGEND:

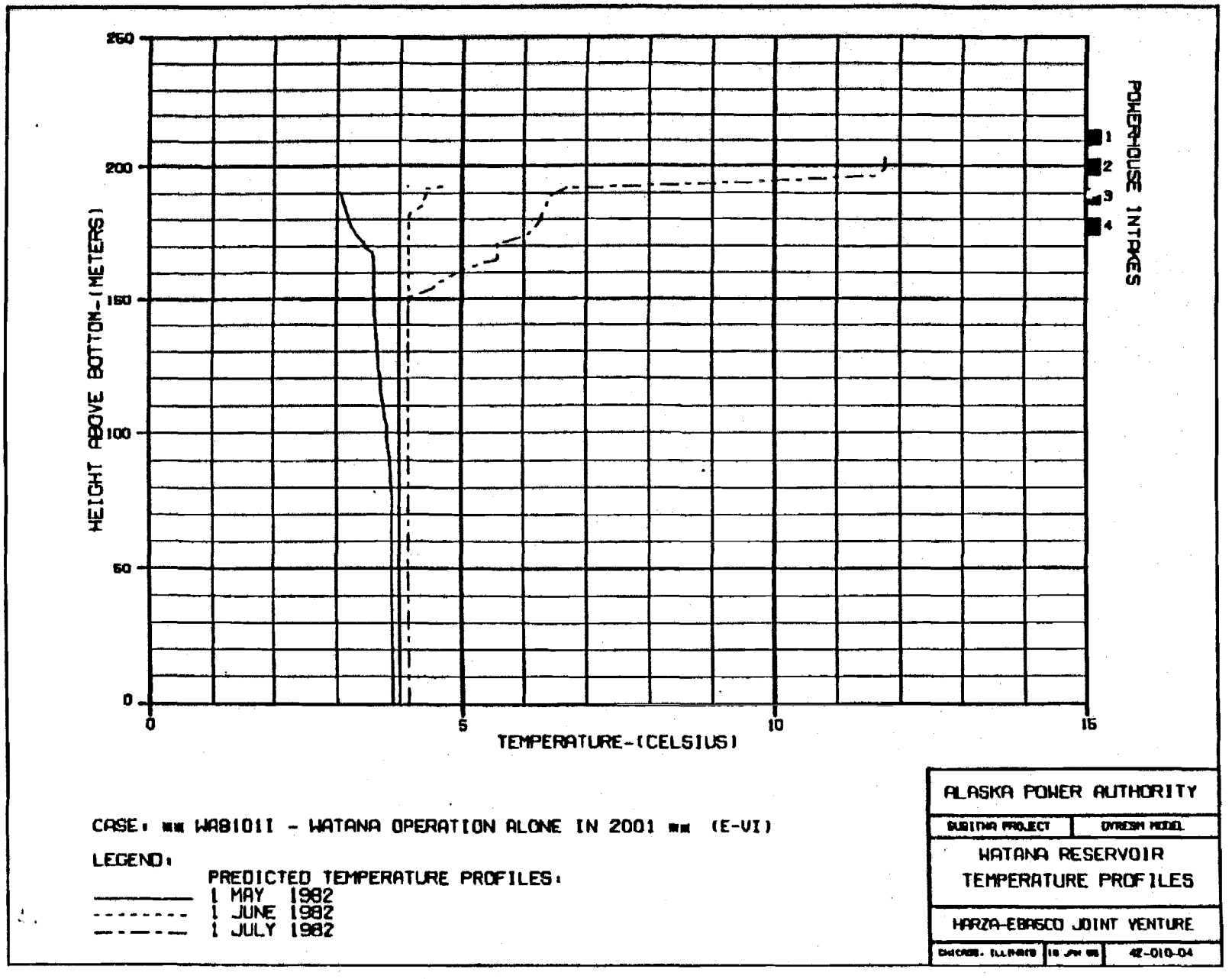
PREDICTED TEMPERATURE PROFILES:

———— 1 FEBRUARY 1982

- - - - - - - - 1 MARCH 1982

— — — — 1 APRIL 1982

ALASKA POWER AUTHORITY	
SUSITNA PROJECT	DYRESM MODEL
WATANA RESERVOIR TEMPERATURE PROFILES	
HARZA-EBASCO JOINT VENTURE	
CHICAGO, ILLINOIS	15 JAN 88	42-010-04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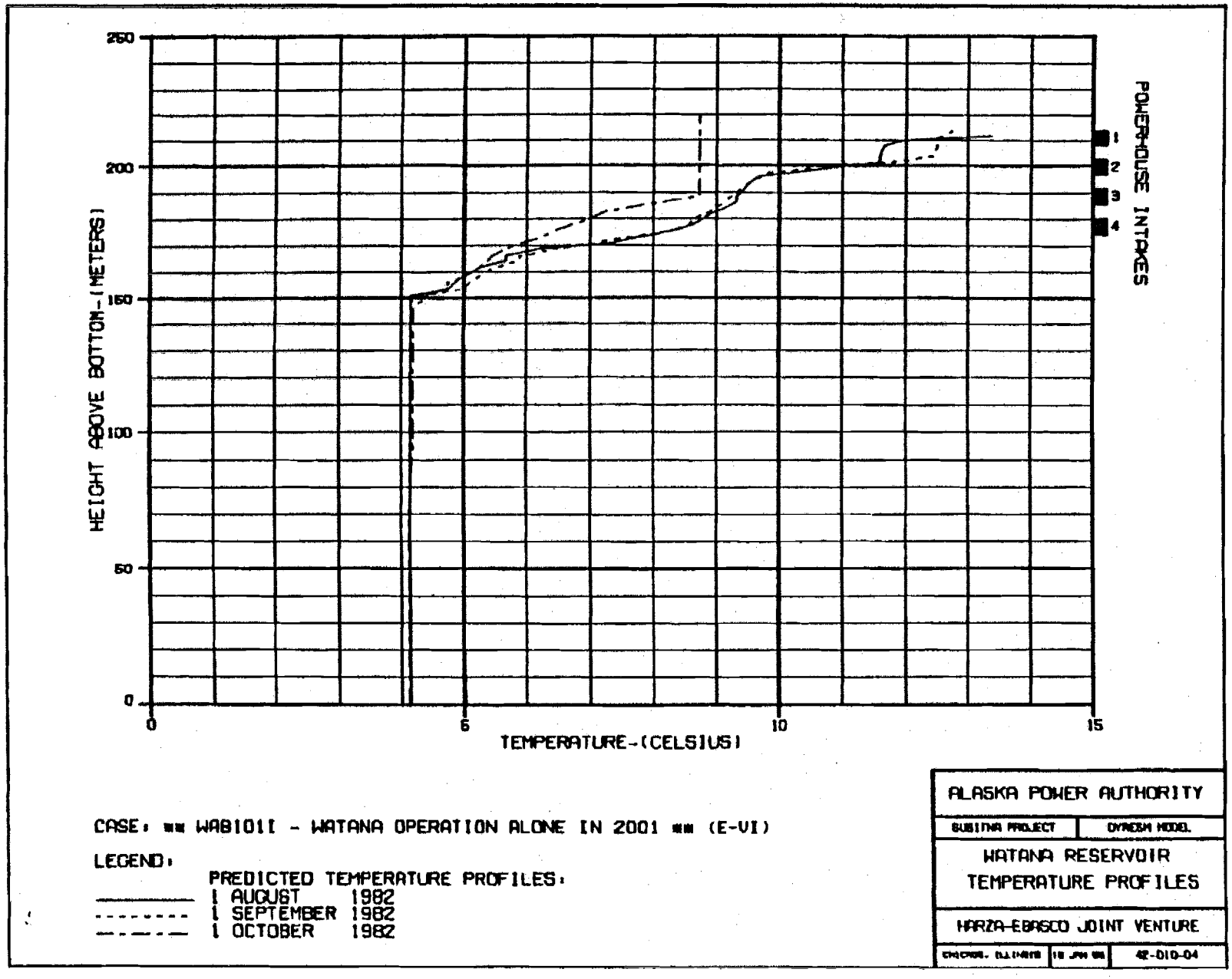
50
0
HEIGHT ABOVE BOTTOM-(METERS)
0
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WAB1011 - WATANA OPERATION ALONE IN 2001 (E-VI)
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 MAY 1982
1 JUNE 1982
1 JULY 1982
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DYRESM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
42-010-04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0
HEIGHT ABOVE BOTTOM-(METERS)
0
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WAB1011 - WATANA OPERATION ALONE IN 2001 (E-VI)
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 AUGUST 1982
1 SEPTEMBER 1982
1 OCTOBER 1982
ALASKA POWER AUTHORITY
SUSITNA PROJECT
CYRESM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
42-010-04

Exhibit G-2

CASE C RESERVOIR TEMPERATURE SIMULATIONS

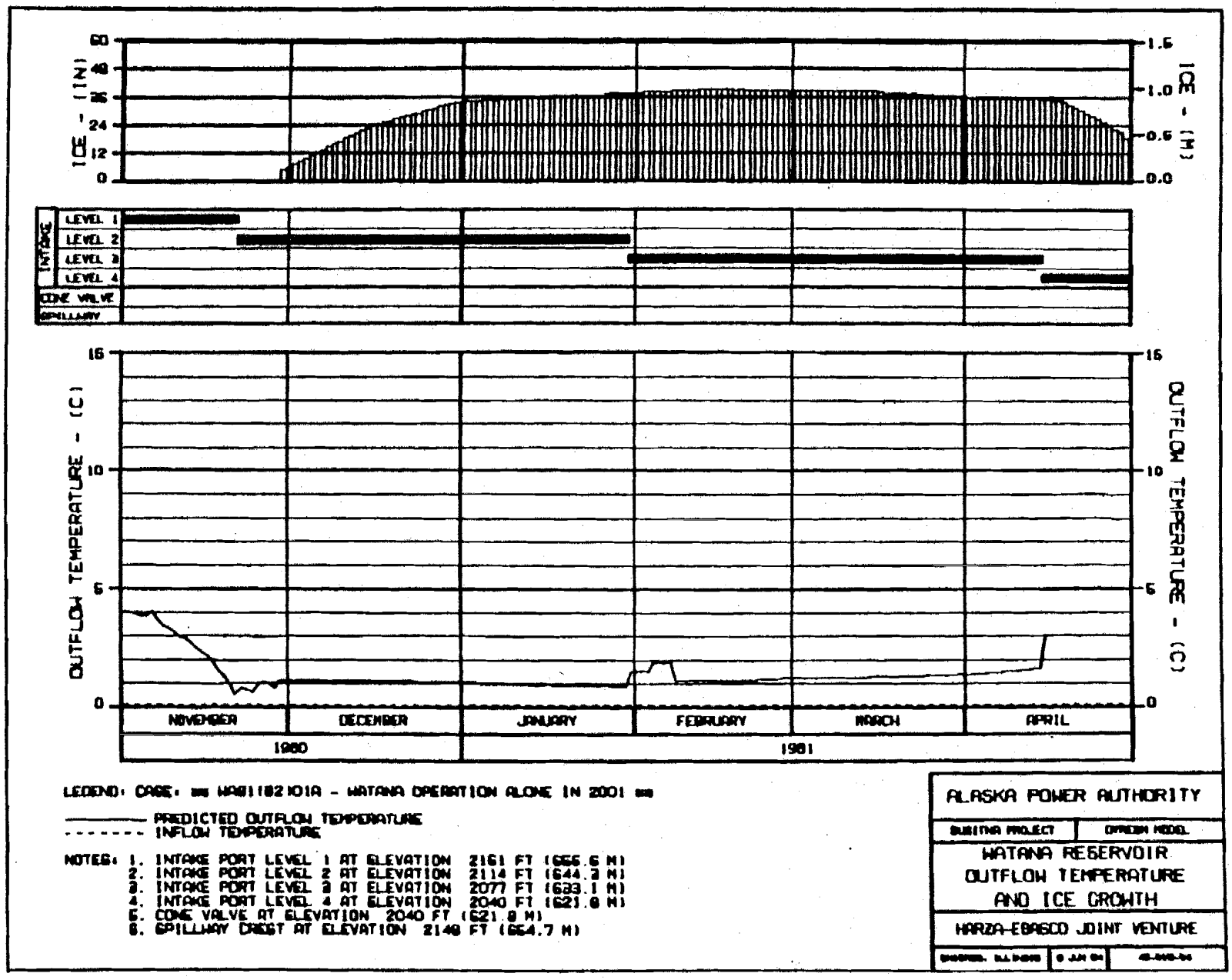
FOR

PROJECTED ENERGY DEMANDS - YEAR 2001

- o Outflow Temperature and Ice Growth Curves (3)
- o Temperature Profiles (11)

Note: 1. Simulations are based on hydrologic and meteorologic data from the period November 1980 to September 1982.

2. Corresponds to Exhibits X and Y, Alaska Power Authority 1984a.



LEGEND: CASE: WA81182101A - WATANA OPERATION ALONE IN 2001

——— PREDICTED OUTFLOW TEMPERATURE
- - - - - - - INFLOW TEMPERATURE

NOTES: 1. INTAKE PORT LEVEL 1 AT ELEVATION 2161 FT (658.6 M)
2. INTAKE PORT LEVEL 2 AT ELEVATION 2114 FT (644.3 M)
3. INTAKE PORT LEVEL 3 AT ELEVATION 2077 FT (633.1 M)
4. INTAKE PORT LEVEL 4 AT ELEVATION 2040 FT (621.8 M)
5. CONE VALVE AT ELEVATION 2040 FT (621.8 M)
6. SPILLWAY CREST AT ELEVATION 2149 FT (654.7 M)

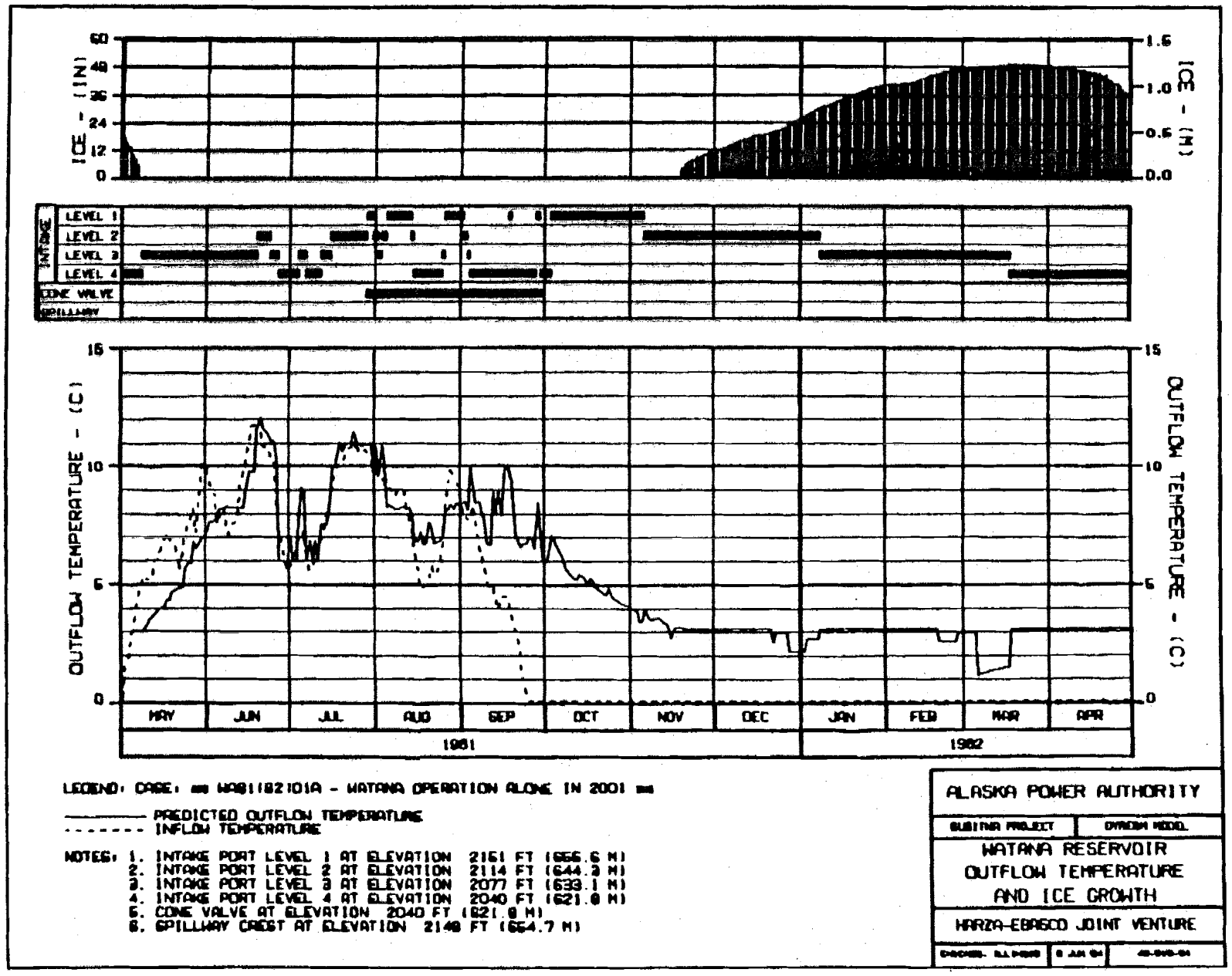
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DYNSIM MODEL

WATANA RESERVOIR
OUTFLOW TEMPERATURE
AND ICE GROWTH

HARZA-EBASCO JOINT VENTURE

DRAWN: [illegible] | 8 JAN 84 | [illegible]



LEGEND: CASE: WA81182101A - WATANA OPERATION ALONE IN 2001

——— PREDICTED OUTFLOW TEMPERATURE
- - - - - - - INFLOW TEMPERATURE

NOTES:
1. INTAKE PORT LEVEL 1 AT ELEVATION 2161 FT (656.6 M)
2. INTAKE PORT LEVEL 2 AT ELEVATION 2114 FT (644.3 M)
3. INTAKE PORT LEVEL 3 AT ELEVATION 2077 FT (633.1 M)
4. INTAKE PORT LEVEL 4 AT ELEVATION 2040 FT (621.8 M)
5. CONE VALVE AT ELEVATION 2040 FT (621.8 M)
6. SPILLWAY CREST AT ELEVATION 2149 FT (654.7 M)

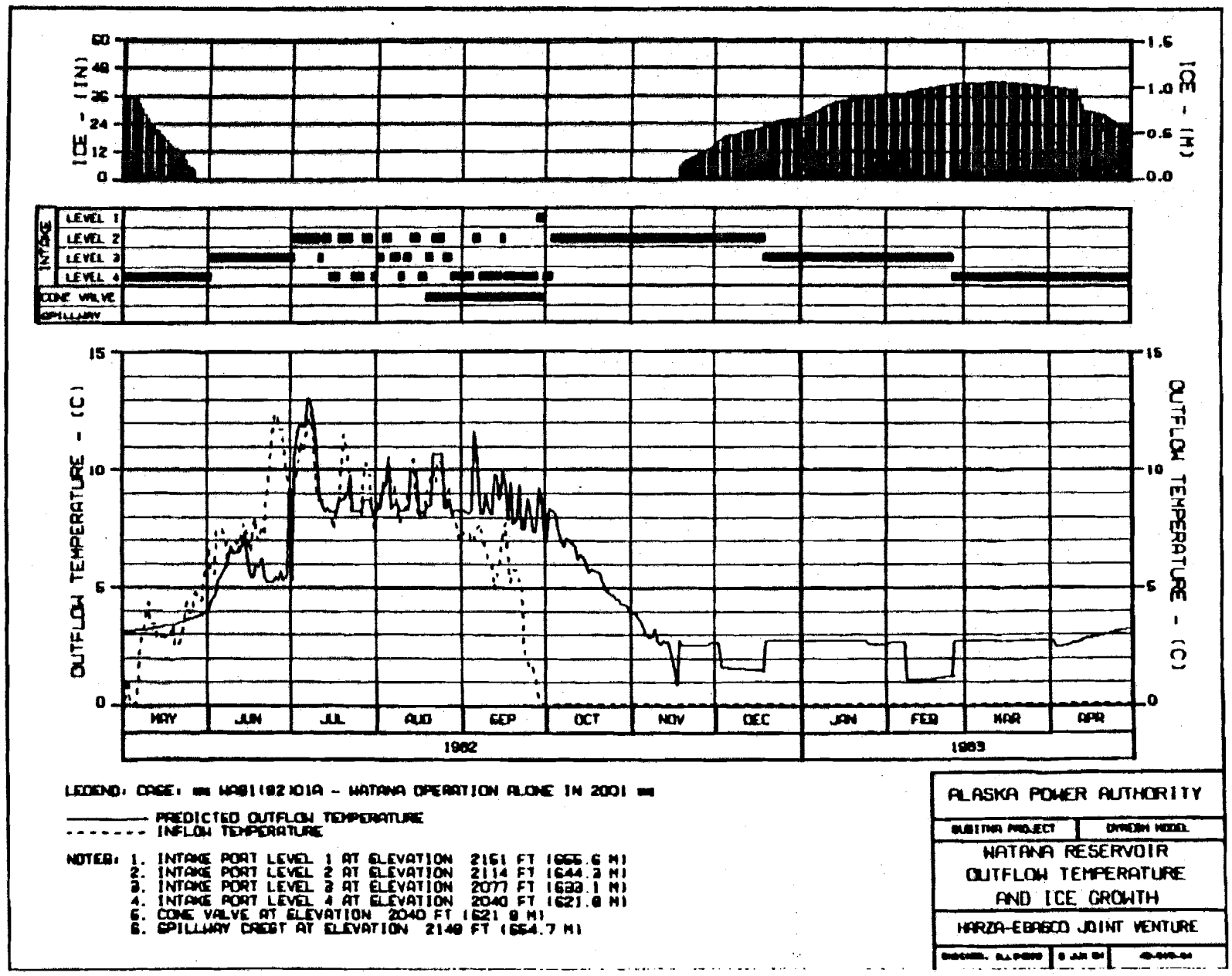
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DYNSIM MODEL

WATANA RESERVOIR
OUTFLOW TEMPERATURE
AND ICE GROWTH

HARZA-EBASCO JOINT VENTURE

DRAWN: [illegible] | 8 JAN 94 | [illegible]



LEGEND: CASE: WA81102101A - WATANA OPERATION ALONE IN 2001

——— PREDICTED OUTFLOW TEMPERATURE
- - - - - - - INFLOW TEMPERATURE

NOTES:
1. INTAKE PORT LEVEL 1 AT ELEVATION 2151 FT (655.6 M)
2. INTAKE PORT LEVEL 2 AT ELEVATION 2114 FT (644.3 M)
3. INTAKE PORT LEVEL 3 AT ELEVATION 2077 FT (633.1 M)
4. INTAKE PORT LEVEL 4 AT ELEVATION 2040 FT (621.8 M)
5. CONE VALVE AT ELEVATION 2040 FT (621.8 M)
6. SPILLWAY CREST AT ELEVATION 2149 FT (654.7 M)

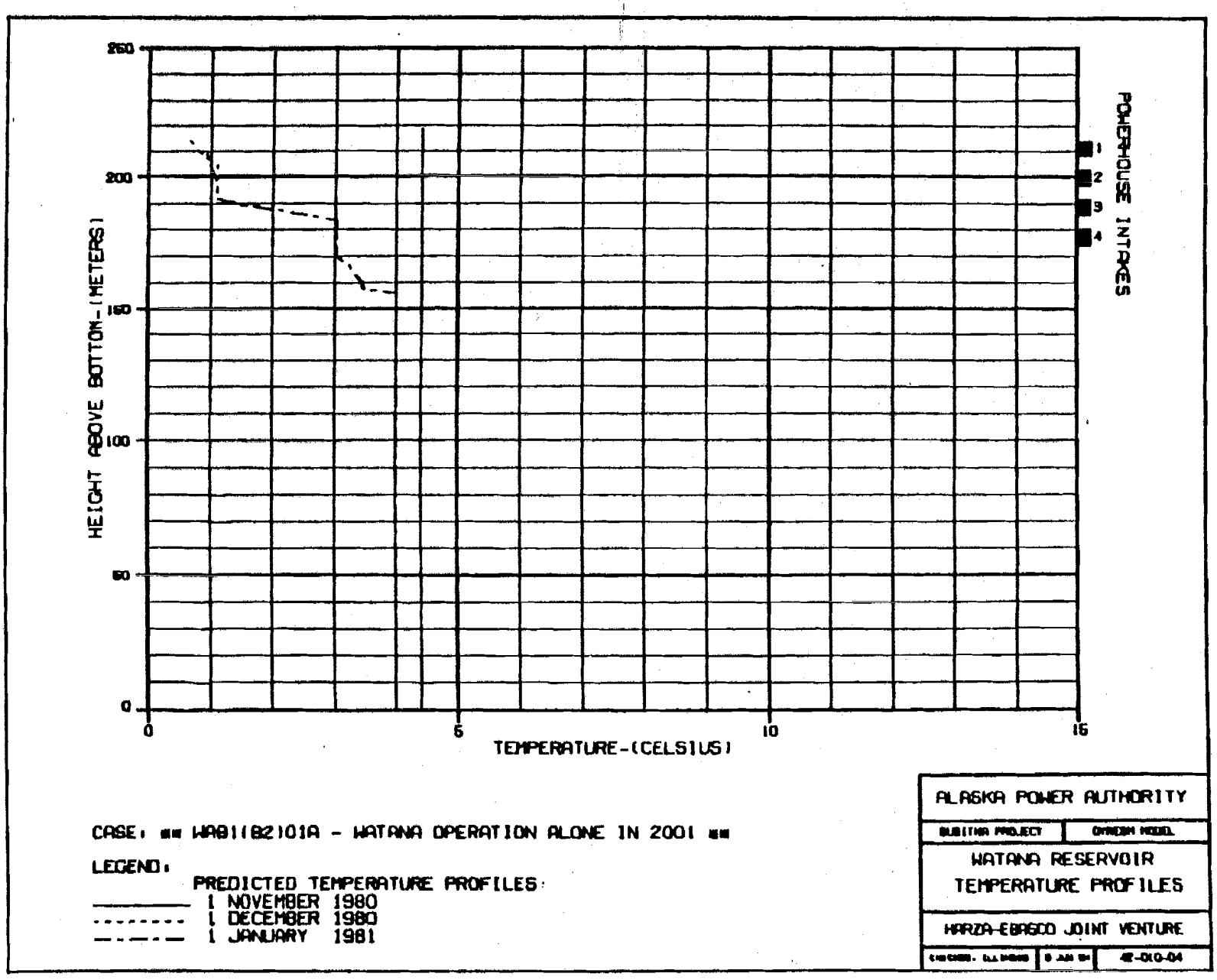
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DYNSIM MODEL

WATANA RESERVOIR
OUTFLOW TEMPERATURE
AND ICE GROWTH

HARZA-EBASCO JOINT VENTURE

[illegible] | 8 JAN 84 | [illegible]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HEIGHT ABOVE BOTTOM-(METERS)
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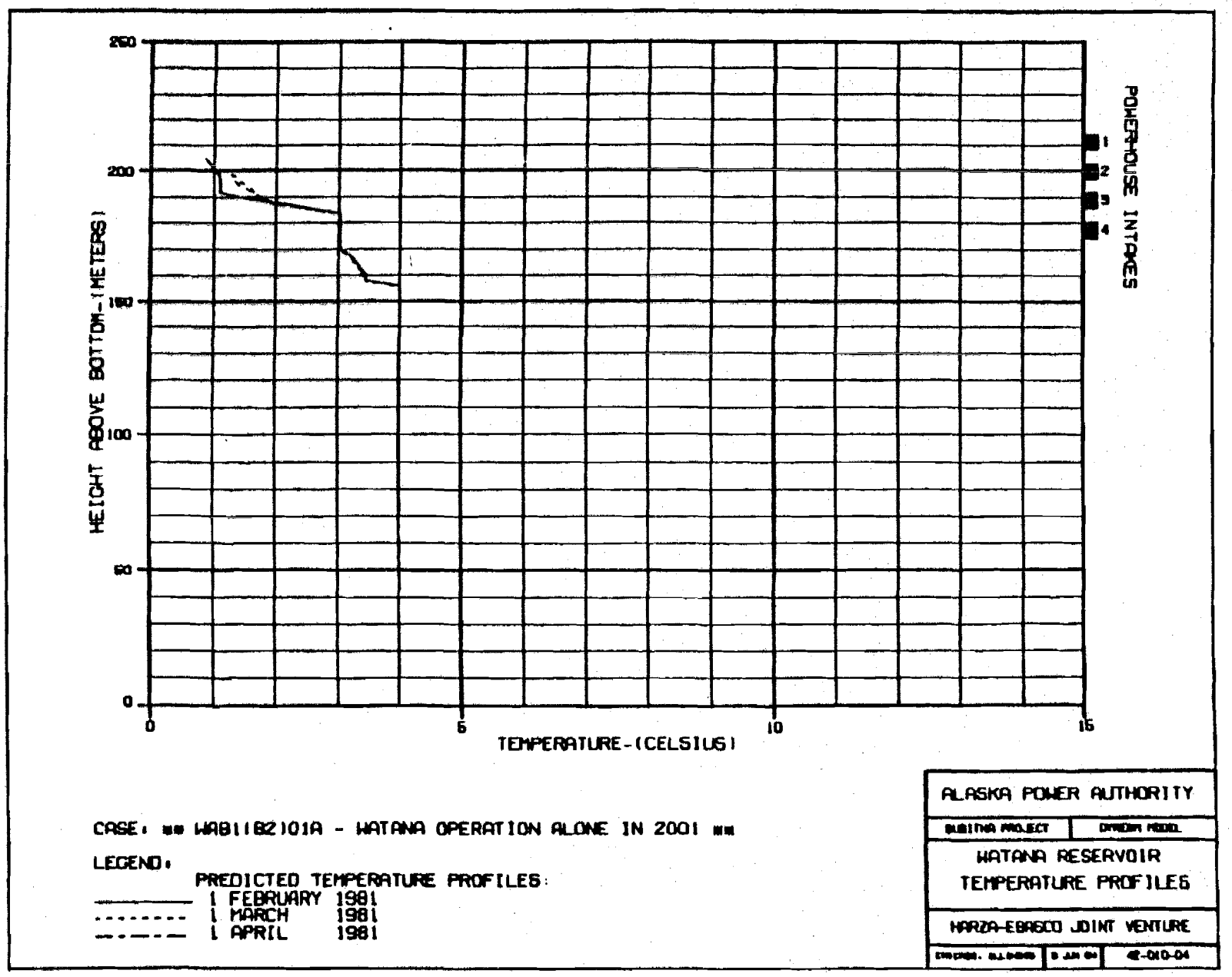
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WA81(82101A - WATANA OPERATION ALONE IN 2001
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 NOVEMBER 1980
1 DECEMBER 1980
1 JANUARY 1981
ALASKA POWER AUTHORITY
SUSITNA PROJECT
CHINOOK MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE



CASE: WA81182101A - WATANA OPERATION ALONE IN 2001

LEGEND:

PREDICTED TEMPERATURE PROFILES:

———— 1 FEBRUARY 1981

- - - - - - - 1 MARCH 1981

—·——·— 1 APRIL 1981

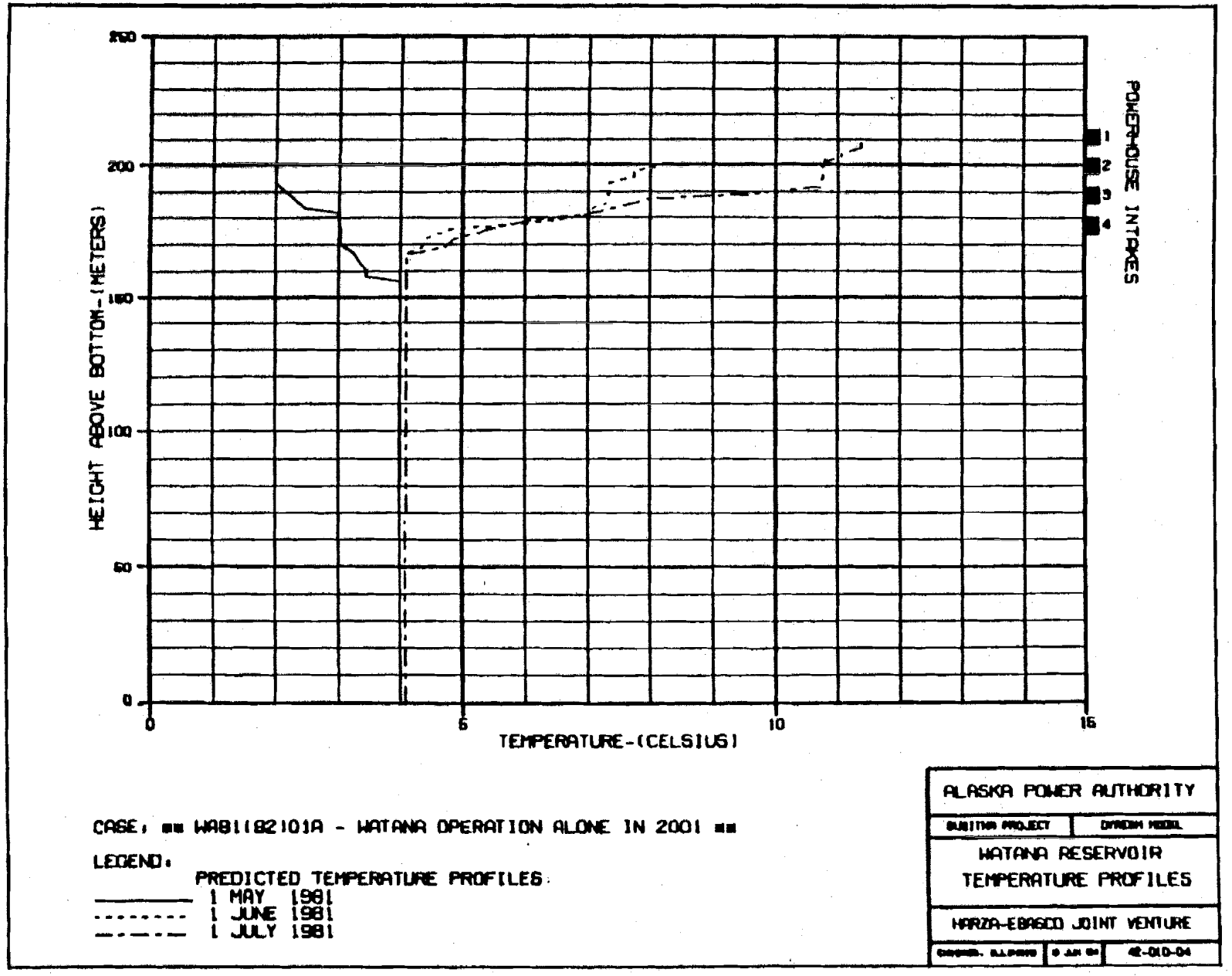
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DRAWN MODEL

WATANA RESERVOIR TEMPERATURE PROFILES

HARZA-EBASCO JOINT VENTURE

DRAWN: R.L.BASS | 9 JAN 84 | 42-010-04



CASE: WAB1(82101A - WATANA OPERATION ALONE IN 2001

LEGEND:

PREDICTED TEMPERATURE PROFILES:

———— 1 MAY 1981

- - - - - - - - 1 JUNE 1981

—·—·— 1 JULY 1981

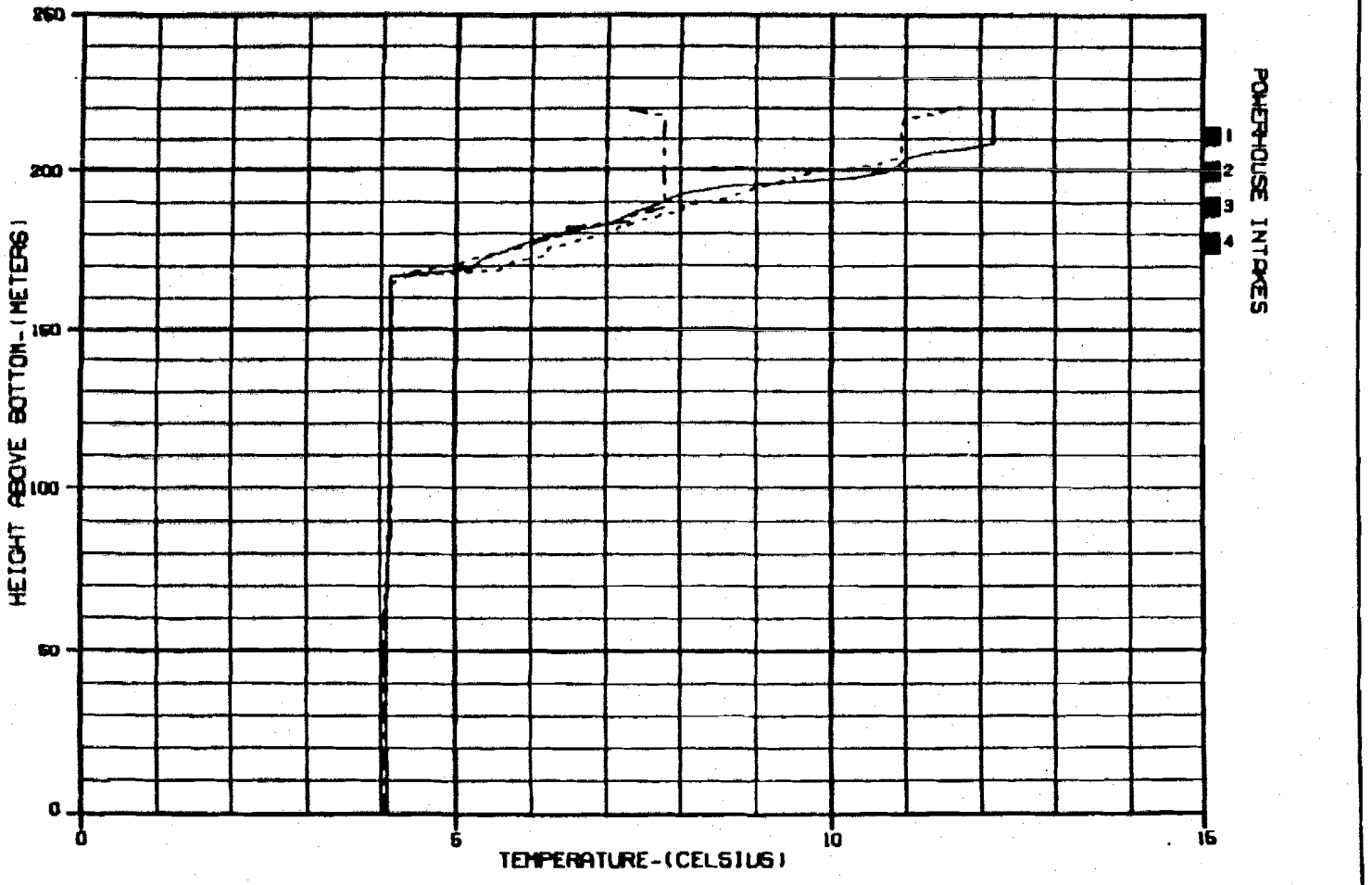
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DAM ON MODEL

WATANA RESERVOIR
TEMPERATURE PROFILES

HARZA-EBASCO JOINT VENTURE

ORIGINAL ILLEGIBLE | 9 JAN 84 | 42-010-04



CASE: WA81182101A - WATANA OPERATION ALONE IN 2001

LEGEND:

PREDICTED TEMPERATURE PROFILES:

———— 1 AUGUST 1981

- - - - - - - 1 SEPTEMBER 1981

— — — — — 1 OCTOBER 1981

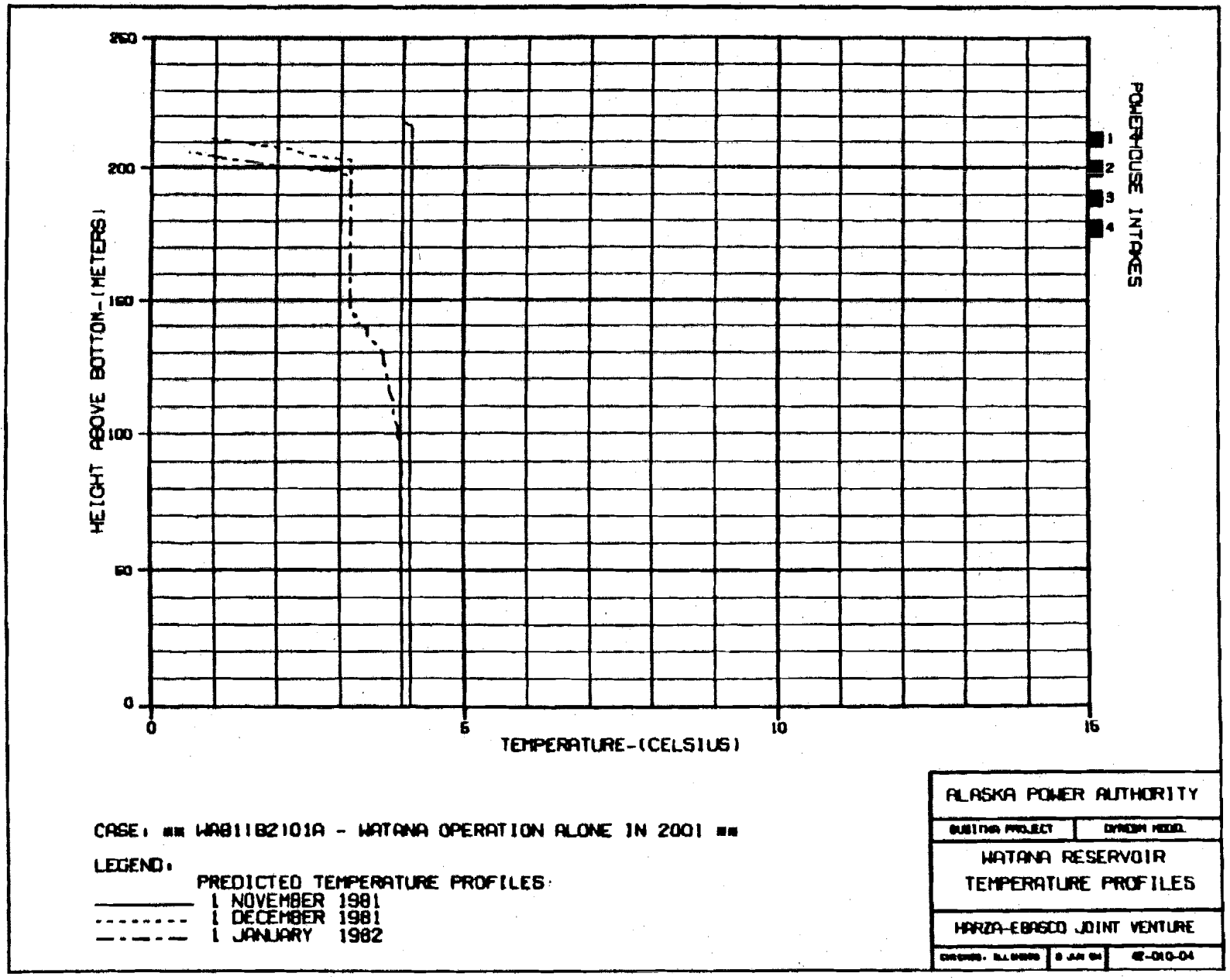
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DRAWN MDD

WATANA RESERVOIR TEMPERATURE PROFILES

HARZA-EBASCO JOINT VENTURE

DRAWN: G.L.H.S | 8 JAN 84 | 42-010-04



CASE: == WA811B2101A - WATANA OPERATION ALONE IN 2001 ==

LEGEND:

PREDICTED TEMPERATURE PROFILES:

———— 1 NOVEMBER 1981

- - - - - - - - 1 DECEMBER 1981

— · — · — · — 1 JANUARY 1982

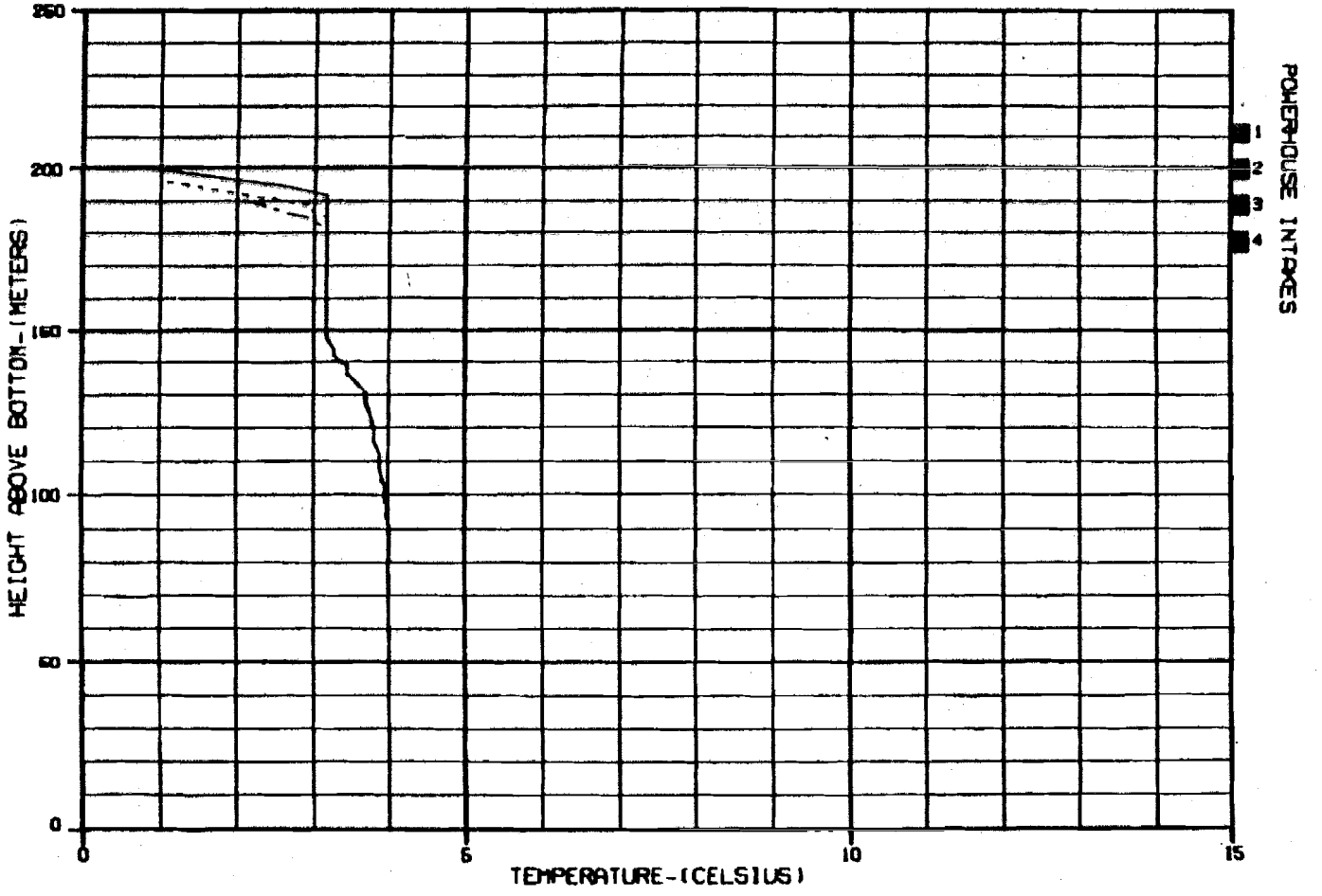
ALASKA POWER AUTHORITY

SUSITNA PROJECT | DIVISION HEDD.

WATANA RESERVOIR
TEMPERATURE PROFILES

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 8 JAN 84 | 42-010-04



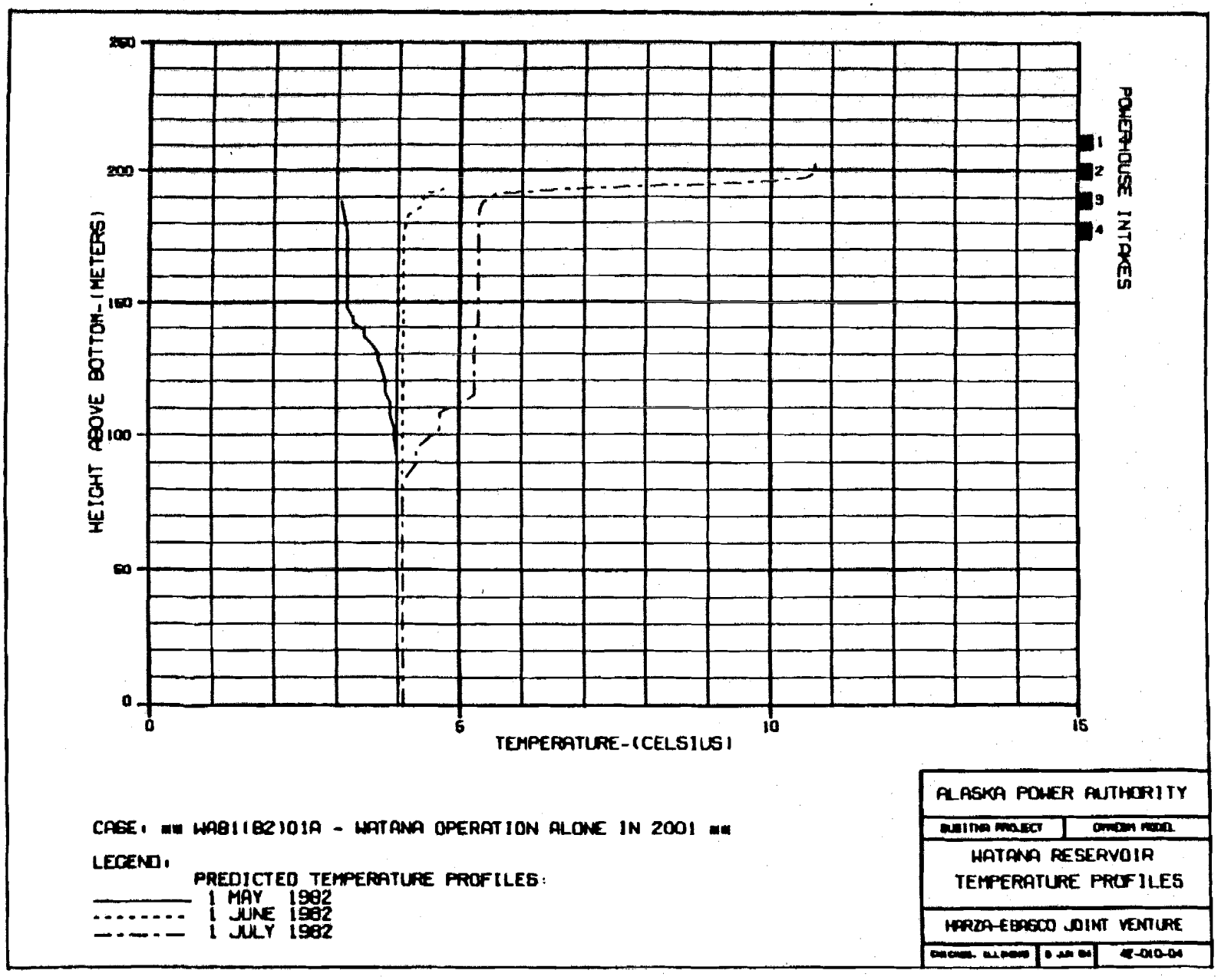
CASE: *** WAB11B2101A - WATANA OPERATION ALONE IN 2001 ***

LEGEND:

PREDICTED TEMPERATURE PROFILES:

———— | FEBRUARY 1982
. . . . . | MARCH 1982
— — — — | APRIL 1982

ALASKA POWER AUTHORITY	
SUSITNA PROJECT	DYRIM MODEL
WATANA RESERVOIR TEMPERATURE PROFILES	
HARZA-EBASCO JOINT VENTURE	
DWG. NO.	4E-010-04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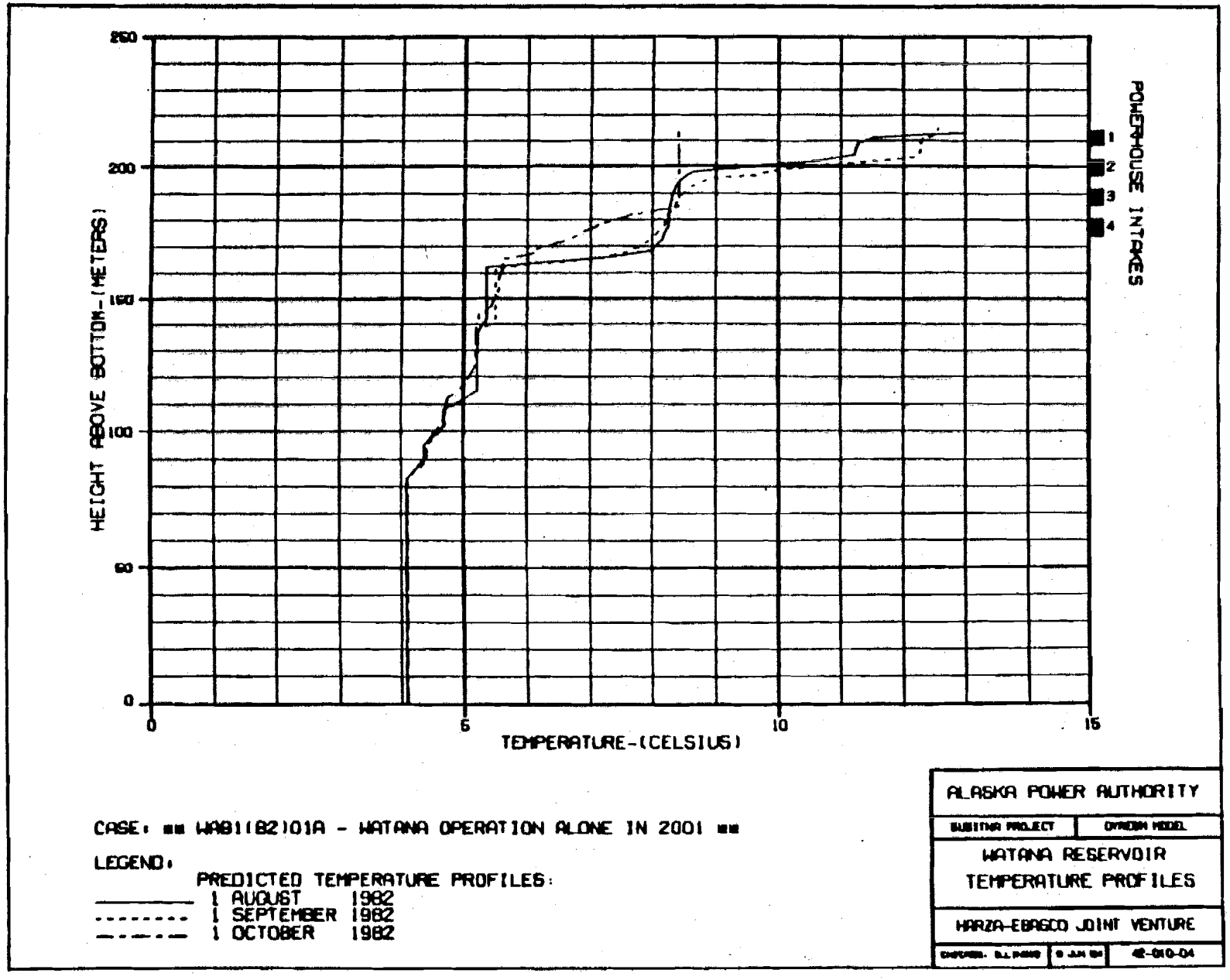
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: *** WAB1(82)01A - WATANA OPERATION ALONE IN 2001 ***
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 MAY 1982
1 JUNE 1982
1 JULY 1982
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DAMSITE MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
CHICAGO, ILLINOIS
9 JAN 84
4E-010-04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250
200
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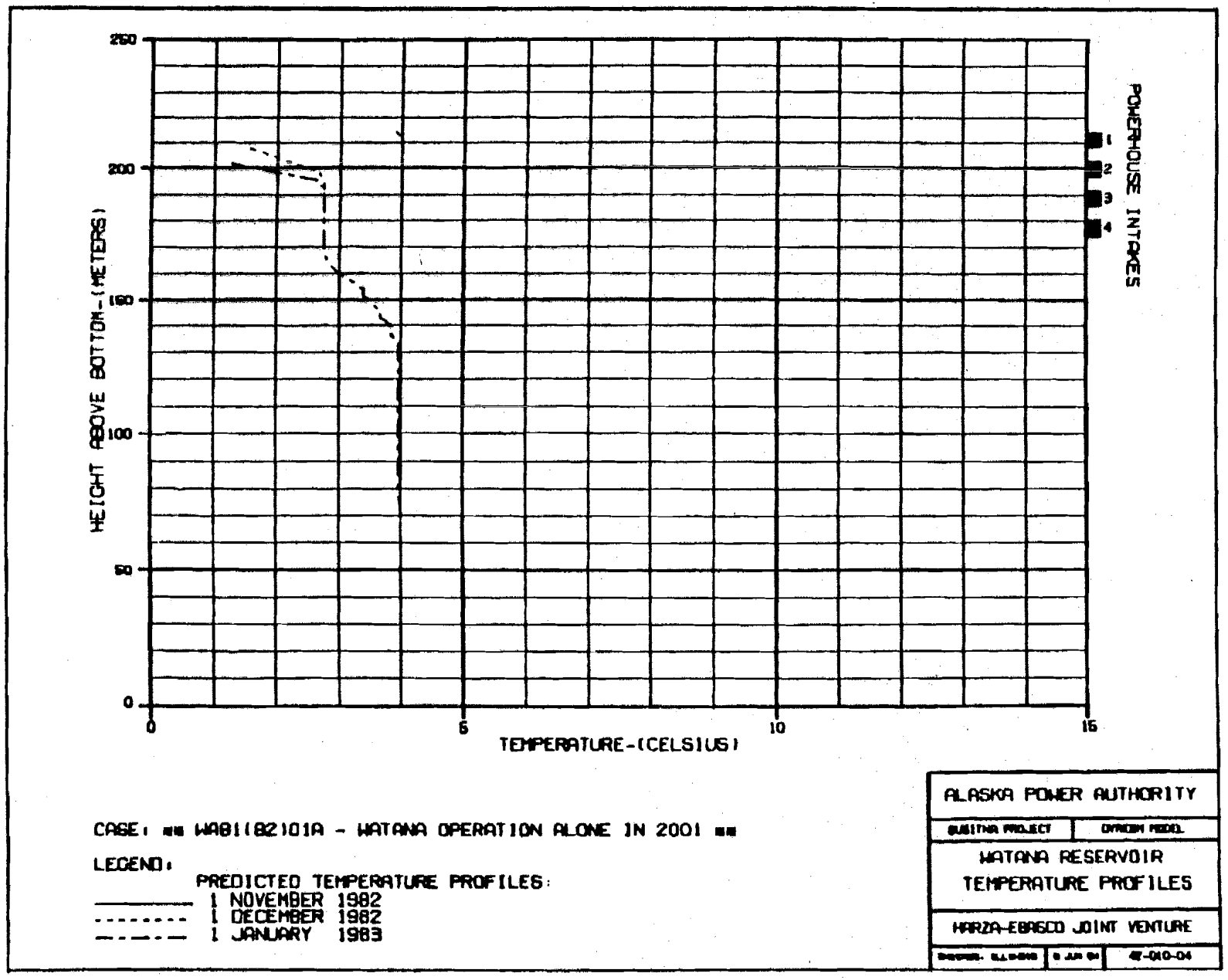
100
50
0
0
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WAB1(82)01A - WATANA OPERATION ALONE IN 2001
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 AUGUST 1982
1 SEPTEMBER 1982
1 OCTOBER 1982
ALASKA POWER AUTHORITY
SUSITNA PROJECT
CHEOM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
9 JAN 84
48-010-04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200
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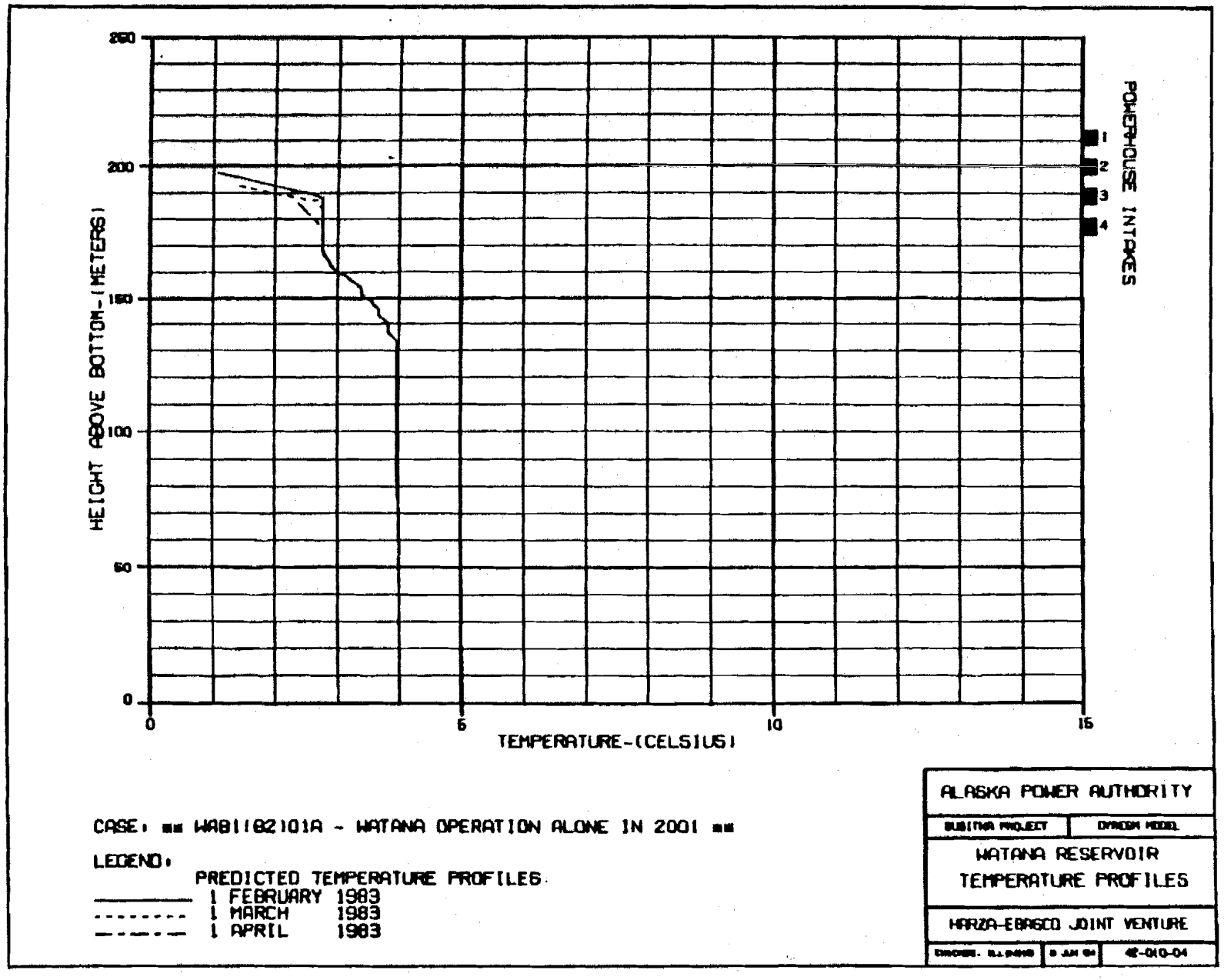
100
50
0
HEIGHT ABOVE BOTTOM-(METERS)
0
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: == WA81(82101A - WATANA OPERATION ALONE IN 2001 ==
LEGEND:
PREDICTED TEMPERATURE PROFILES:
1 NOVEMBER 1982
1 DECEMBER 1982
1 JANUARY 1983
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DYNSIM MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
9 JAN 84
87-010-04



CASE: WAB1182101A - WATANA OPERATION ALONE IN 2001

LEGEND:

PREDICTED TEMPERATURE PROFILES

——— 1 FEBRUARY 1983
- - - - - - - - 1 MARCH 1983
— - — - — - 1 APRIL 1983

ALASKA POWER AUTHORITY

SUSITNA PROJECT | DYNSIM MODEL

WATANA RESERVOIR
TEMPERATURE PROFILES

HARZA-EBASCO JOINT VENTURE

DRAWN: R.L.P.H.B. | 9 JAN 84 | 42-010-04

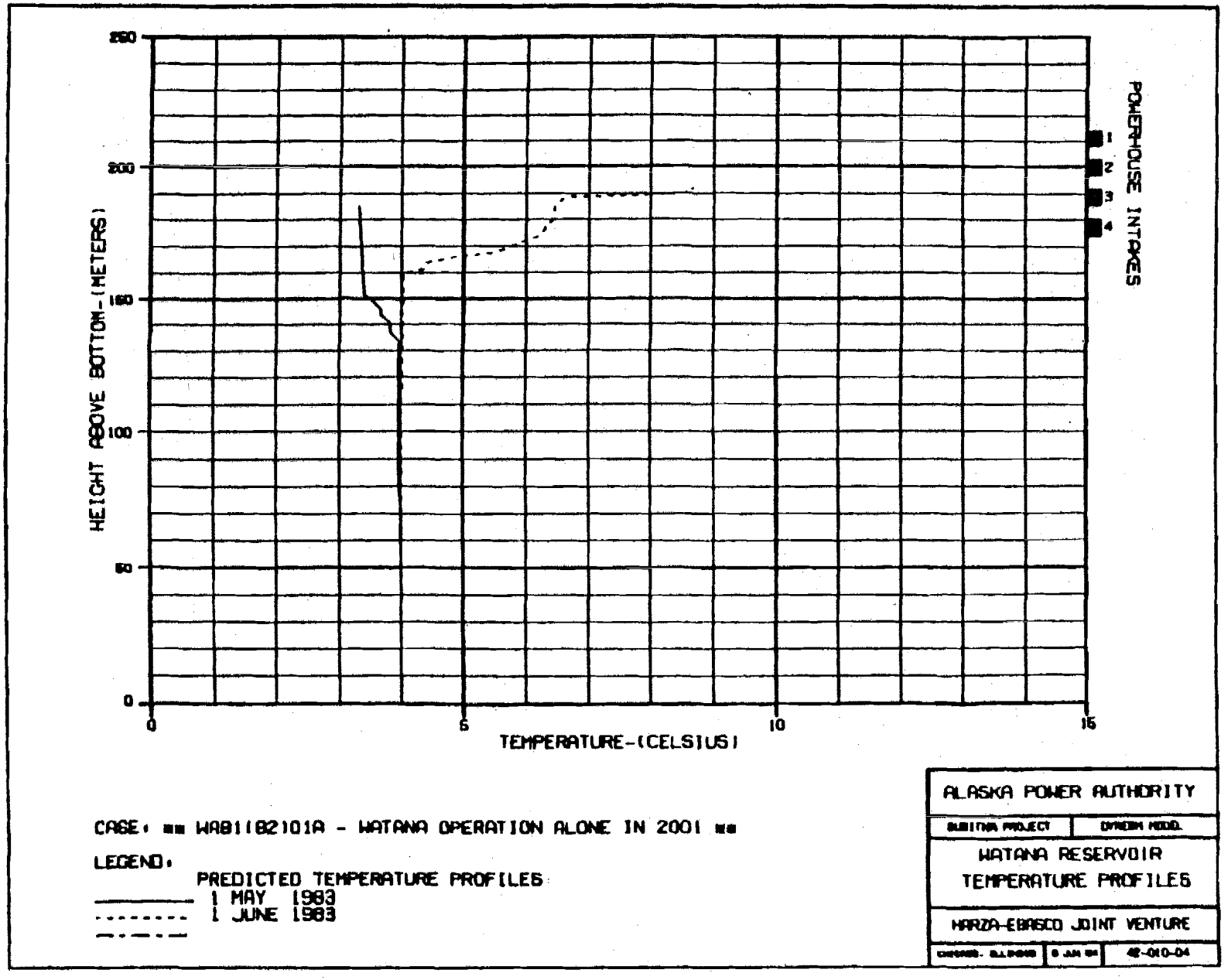

HEIGHT ABOVE BOTTOM-(METERS)
250
200
150
100
50
0
0
5
10
15
TEMPERATURE-(CELSIUS)
POWERHOUSE INTAKES
1
2
3
4
CASE: WAB11B2101A - WATANA OPERATION ALONE IN 2001
LEGEND:
PREDICTED TEMPERATURE PROFILES
1 MAY 1983
1 JUNE 1983
ALASKA POWER AUTHORITY
SUSITNA PROJECT
DIVERSION MODEL
WATANA RESERVOIR
TEMPERATURE PROFILES
HARZA-EBASCO JOINT VENTURE
CHICAGO, ILLINOIS
8 JAN 84
12-010-04

Exhibit G-3

CASE E-VI RIVER TEMPERATURE SIMULATIONS

FOR

PROJECTED ENERGY DEMANDS - YEAR 2001

- Temperature Tables, Summer 1981 and 1982
- Middle Susitna River Isotherms (3)

Note: Simulations are based on hydrologic and meteorologic data from the period May 1981 to September 1982.

STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1981
ENERGY DEMAND 2001

River Mile	MAY 31	32	33	34	35	JUNE 36	37	38	39	JULY 40	41	42	43
184[1]	2.2	2.9	4.0	5.2	6.8	7.9	8.7	10.6	9.1	7.6	7.4	10.4	11.5
173	2.4	3.0	3.8	5.1	6.6	7.5	8.6	10.4	8.9	7.8	7.7	9.9	11.0
162	2.6	3.4	4.3	5.5	7.1	7.7	9.0	10.8	9.2	8.1	8.0	10.1	11.2
150[2]	2.9	3.6	4.4	5.7	7.2	7.7	9.1	10.8	9.3	8.4	8.3	10.1	11.1
140	3.1	3.8	4.5	5.8	7.3	7.7	9.3	11.0	9.3	8.6	8.4	10.1	11.1
130	3.3	4.1	4.7	6.0	7.4	7.6	9.2	10.9	9.1	8.6	8.3	9.6	10.6
120	3.6	4.6	5.3	6.5	7.9	7.9	9.7	11.3	9.5	8.9	8.6	9.9	11.0
110	3.8	5.1	5.7	6.9	8.4	8.2	10.1	11.7	9.8	9.2	8.8	10.2	11.2
99[1]	4.1	5.5	6.2	7.3	8.9	8.4	10.5	12.1	10.1	9.1	9.1	10.5	11.5

River Mile	AUGUST 44	45	46	47	48	SEPTEMBER 49	50	51	52	OCTOBER 1	2	3	4	5
184[1]	11.0	9.1	7.6	7.1	8.4	8.7	8.0	8.7	7.3	6.6	5.6	5.2	4.7	4.1
173	10.4	9.2	7.7	7.2	8.5	8.7	7.9	8.5	6.9	5.1	5.2	4.5	4.1	3.4
162	10.6	9.4	7.8	7.4	8.6	8.8	7.9	8.4	6.7	5.8	5.1	4.5	3.9	2.9
150[2]	10.6	9.6	8.1	8.7	8.9	8.9	8.0	8.5	6.6	5.6	5.0	4.3	3.8	2.7
140	10.6	9.8	8.2	8.8	9.0	9.0	8.0	8.4	6.4	5.4	4.8	4.1	3.6	2.4
130	10.2	9.5	7.9	7.8	9.0	9.0	7.9	8.3	6.1	5.2.	4.6	3.9	3.3	1.9
120	10.5	9.8	8.1	8.0	9.3	9.1	8.0	8.3	5.9	5.0	4.5	3.8	3.2	1.5
110	10.8	10.1	8.2	8.2	9.5	9.2	8.1	8.3	5.8	4.8	4.4	3.7	3.1	1.1
99[1]	11.1	10.4	8.4	8.4	9.7	9.4	8.2	8.3	5.6	4.6	4.3	3.6	3.0	0.6

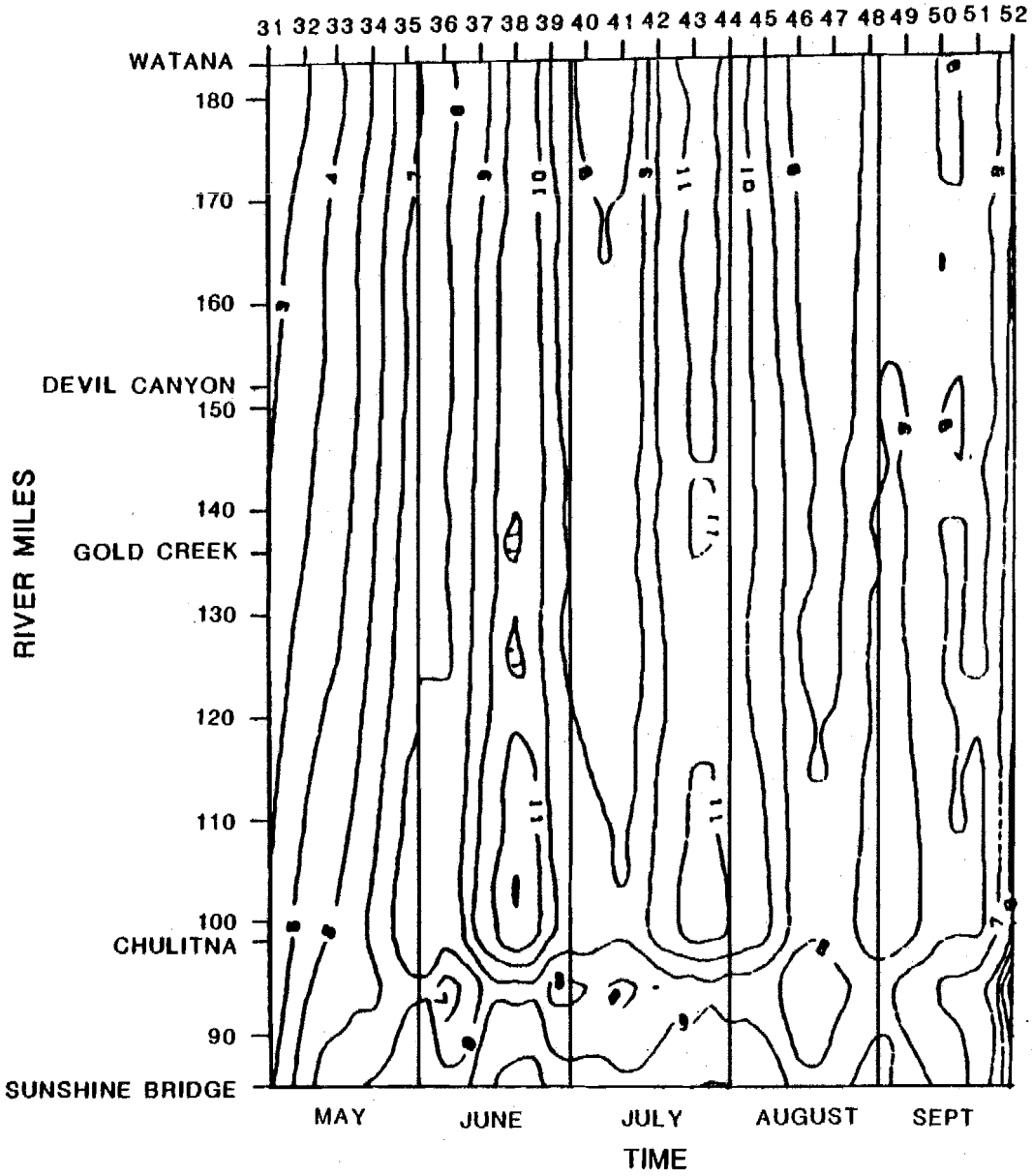
1/ Downstream of Watana Dam
2/ Downstream of Devil Canyon
3/ Upstream of confluence with Chulitna River

STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1982
ENERGY DEMAND 2001

River Mile	MAY 31	32	33	34	35	JUNE 36	37	38	39	JULY 40	41	42	43
184[1]	3.1	3.3	3.6	3.7	4.1	5.4	6.5	6.2	6.9	7.0	8.6	9.5	9.3
173	3.3	3.2	3.4	3.5	4.1	5.3	6.3	6.5	7.4	7.5	8.9	9.8	9.3
162	3.5	3.4	3.8	3.9	4.5	5.6	6.5	6.9	7.9	8.0	9.3	10.2	9.6
150[2]	3.8	3.5	3.9	3.9	4.7	5.7	6.6	7.1	8.2	8.4	9.6	10.5	9.8
140	3.9	3.6	3.9	4.0	4.8	5.8	6.6	7.2	8.5	8.7	9.8	10.6	9.8
130	4.2	3.7	4.1	4.2	5.0	5.9	6.6	7.3	8.6	8.8	9.7	10.5	9.4
120	4.5	4.0	4.5	4.6	5.5	6.3	6.9	7.8	9.1	9.3	10.1	10.9	9.7
110	4.8	4.2	4.9	4.9	5.9	6.6	7.2	8.1	9.6	9.7	10.5	11.3	10.0
99[3]	5.2	4.4	5.2	5.2	6.3	6.9	7.4	8.5	10.1	10.1	10.9	11.7	10.4

River Mile	AUGUST 44	45	46	47	48	SEPTEMBER 49	50	51	52
184[1]	9.2	9.2	9.5	9.9	8.9	9.3	9.5	8.5	7.9
173	9.4	9.5	9.7	10.1	8.9	8.9	8.8	7.6	7.0
162	9.8	9.9	9.9	10.3	9.1	8.9	8.8	7.5	6.9
150[2]	10.1	10.2	10.2	10.5	9.2	8.9	8.6	7.3	6.6
140	10.2	10.4	10.3	10.6	9.4	8.9	8.5	7.2	6.4
130	10.0	10.3	10.2	10.6	9.3	8.7	8.2	6.9	6.1
120	10.4	10.8	10.6	11.0	9.6	8.8	8.3	7.0	6.1
110	10.8	11.2	10.9	11.3	9.8	8.9	8.4	7.1	6.1
99[3]	11.2	11.6	11.2	11.6	10.1	9.0	8.5	7.1	6.0

1/ Downstream of Watana Dam
2/ Downstream of Devil Canyon
3/ Upstream of confluence with Chulitna River



NOTE:

1. TEMPERATURES IN °C

WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1981 CLIMATE DATA

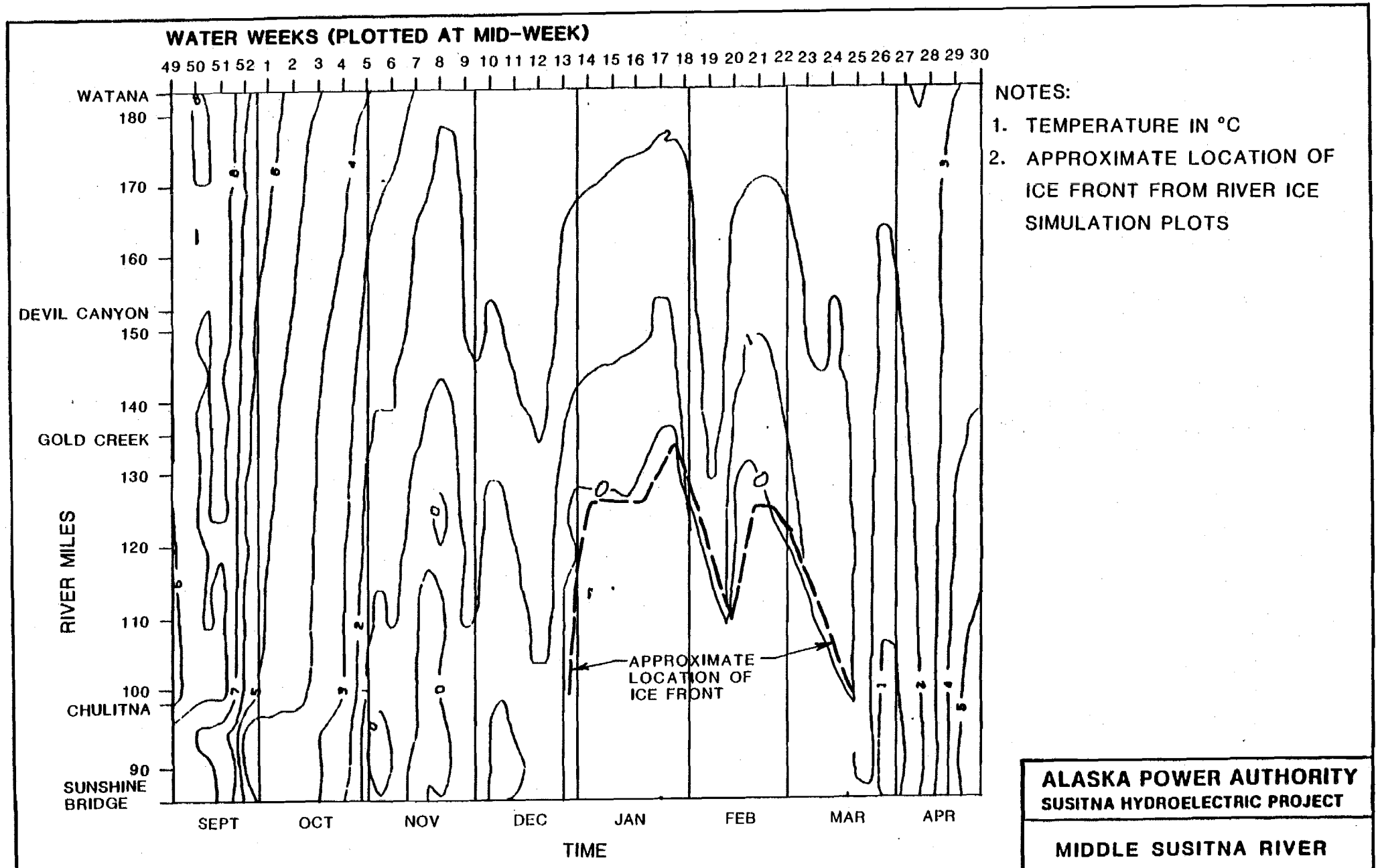
CASE E-VI FLOW REQUIREMENTS

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

MIDDLE SUSITNA RIVER
ISOTHERMS

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

MARZA-EBASCO
SUSITNA JOINT VENTURE



NOTES:

1. TEMPERATURE IN °C
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS

WATANA ONLY, 2001 ENERGY DEMAND

WINTER 1981-1982 CLIMATE DATA

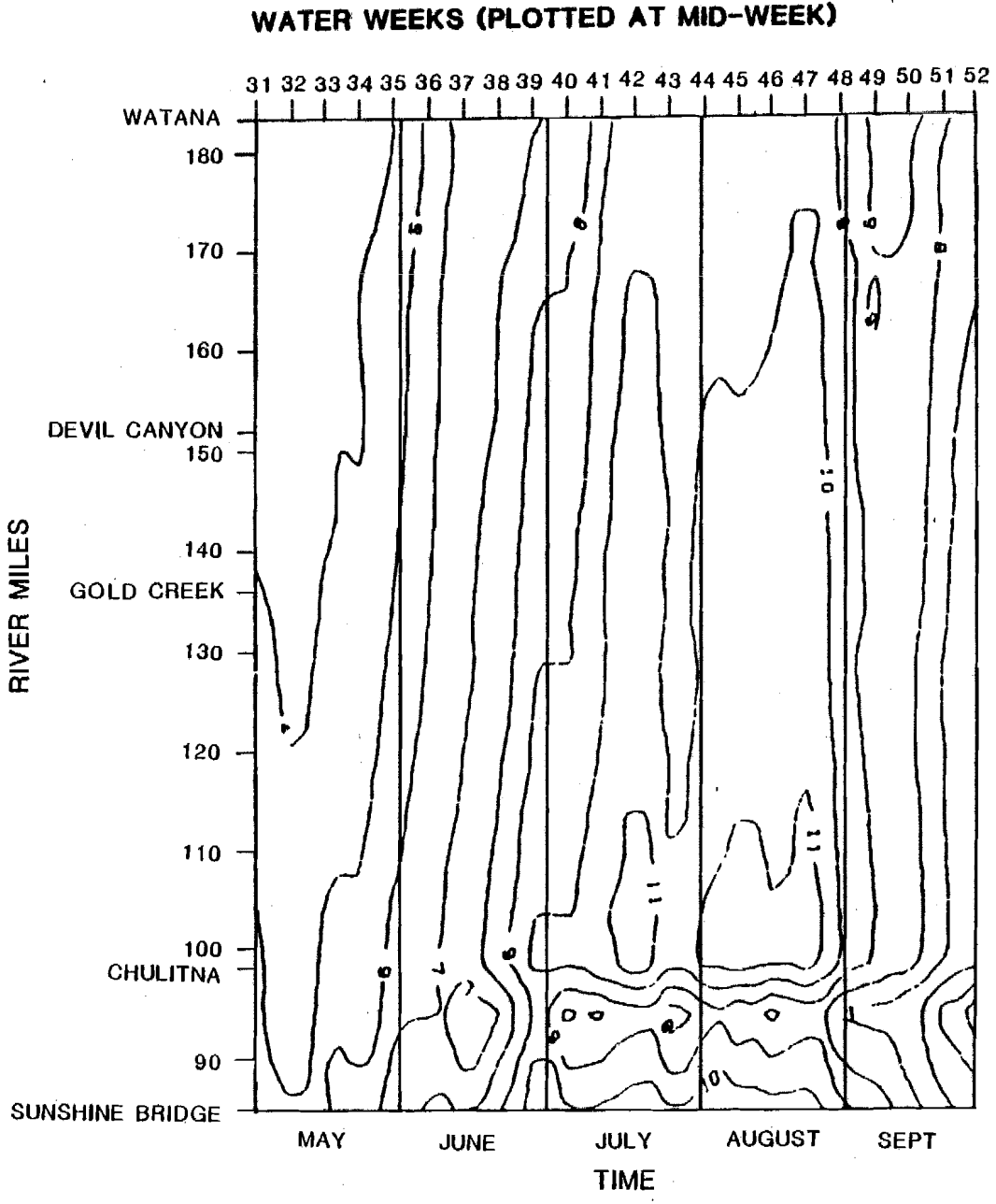
CASE E-VI FLOW REQUIREMENTS

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

MIDDLE SUSITNA RIVER ISOTHERMS

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE



NOTE:

1. TEMPERATURES IN °C

WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1982 CLIMATE DATA

CASE E-VI FLOW REQUIREMENTS

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

MIDDLE SUSITNA RIVER
ISOTHERMS

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

Exhibit G-4

CASE C RIVER TEMPERATURE SIMULATIONS

FOR

PROJECTED ENERGY DEMANDS - YEAR 2001

- Stream Temperature Tables (2)
- Middle Susitna River Isotherms (4)

Note: 1. Simulations are based on hydrologic and meteorologic data from the period May 1981 to September 1982.

2. Corresponds to Exhibits AD and AE, Alaska Power Authority 1984b.

STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1981
ENERGY DEMAND: 2001

WATER WEEK NO.

River	May					June				July				
Mile	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184[1]	3.0	3.2	4.2	5.3	7.0	8.1	8.6	11.1	8.1	7.3	6.9	10.2	11.0	10.5
173	3.1	3.2	3.8	5.0	6.4	7.2	8.3	10.5	8.0	7.6	7.6	9.9	10.7	10.2
162	3.3	3.8	4.4	5.6	7.2	7.6	9.0	11.2	8.5	8.0	7.9	10.1	10.9	10.4
150[2]	3.6	3.9	4.5	5.7	7.2	7.4	9.0	11.1	8.7	8.4	8.2	10.2	11.0	10.5
140	3.7	4.1	4.6	5.8	7.2	7.3	9.1	11.1	8.8	8.6	8.4	10.2	11.0	10.5
130	3.9	4.4	4.8	6.0	7.3	7.1	9.0	10.7	8.6	8.5	8.2	9.8	10.7	10.3
120	4.2	4.9	5.4	6.6	8.0	7.6	9.6	11.3	9.1	8.9	8.5	10.1	11.0	10.5
110	4.4	5.4	5.9	7.1	8.6	7.9	10.2	11.9	9.5	9.3	8.8	10.3	11.2	10.8
99 [3]	4.7	5.9	6.4	7.6	9.2	8.3	10.7	12.3	9.9	9.6	9.1	10.6	11.4	10.0
98 [4]	4.5	5.7	6.2	6.8	7.6	6.7	8.1	8.8	7.9	8.1	8.0	8.6	9.1	9.0
84 [5]	4.8	6.4	7.1	7.5	8.5	7.2	8.9	9.6	8.6	8.8	8.5	9.1	9.5	9.6

WATER WEEK NO.

River	August				September				October				
Mile	45	46	47	48	49	50	51	52	1	2	3	4	5
184[1]	8.3	7.5	7.0	8.3	8.7	7.9	8.5	7.0	6.5	5.4	5.0	4.5	4.0
173	8.5	7.6	7.2	8.4	8.7	7.8	8.3	6.6	6.0	5.1	4.6	4.0	3.4
162	8.6	7.7	7.3	8.6	8.8	7.8	8.3	6.4	5.7	5.0	4.4	3.9	2.9
150[2]	8.9	8.0	7.6	8.8	9.0	7.9	8.3	6.4	5.6	5.0	4.4	3.8	2.8
140	9.0	8.0	7.8	8.9	9.0	8.0	8.3	6.2	5.4	4.9	4.2	3.6	2.4
130	9.1	8.0	7.8	9.0	9.0	7.9	8.1	6.0	5.1	4.7	4.0	3.4	2.0
120	9.3	8.1	8.0	9.2	9.1	8.0	8.2	5.8	5.0	4.6	3.9	3.3	1.6
110	9.5	8.2	8.1	9.4	9.3	8.0	8.2	5.7	4.8	4.6	3.8	3.2	1.3
99 [3]	9.7	8.4	8.3	9.6	9.4	8.1	8.2	5.5	4.6	4.4	3.7	3.1	0.9
98 [4]	8.7	7.6	7.8	8.4	7.9	7.2	6.7	4.3	3.6	3.7	3.0	2.7	1.0
84 [5]	9.3	7.8	8.2	9.0	8.2	7.3	6.8	3.9	3.2	3.4	2.7	2.4	0.5

[1] Downstream of Watana Dam Site
[2] Downstream of Devil Canyon Dam Site
[3] Upstream of Susitna - Chulitna confluence
[4] Downstream of Susitna - Chulitna confluence (full mixing assumed)
[5] At Sunshine stream gaging station at Parks Highway Bridge

420723
840817

STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1982
ENERGY DEMAND: 2001

WATER WEEK NO.

River Mile	May					June				July				
	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184 1/	3.2	3.2	3.4	3.6	4.0	5.7	6.5	5.7	6.0	10.9	10.0	8.6	8.6	8.7
173	3.3	3.1	3.2	3.3	3.9	5.2	6.0	6.3	7.0	10.4	9.9	9.1	8.8	8.9
162	3.6	3.3	3.6	3.7	4.6	5.8	6.4	6.9	7.9	10.8	10.3	9.6	9.0	9.3
150 2/	3.8	3.4	3.7	3.7	4.7	5.7	6.4	7.1	8.2	10.7	10.5	10.0	9.3	9.6
140	4.0	3.5	3.8	3.8	4.8	5.8	6.4	7.2	8.5	10.7	10.6	10.2	9.4	9.7
130	4.3	3.6	4.0	4.0	5.0	5.8	6.3	7.3	8.5	10.3	10.2	10.1	9.2	9.7
120	4.6	3.9	4.4	4.5	5.6	6.3	6.7	7.8	9.2	10.8	10.6	10.6	9.5	10.1
110	4.9	4.2	4.8	4.8	6.1	6.7	7.0	8.2	9.8	11.2	11.0	11.1	9.8	10.4
99 3/	5.3	4.4	5.3	5.3	6.6	7.1	7.4	8.7	10.4	11.6	11.4	11.5	10.1	10.8
98 4/	5.1	4.3	5.2	5.3	6.3	6.7	6.3	6.9	8.8	8.5	8.4	8.9	8.2	8.9
84 5/	5.5	4.7	5.9	6.0	7.3	7.7	6.9	7.9	9.8	9.2	9.2	9.7	8.9	9.7

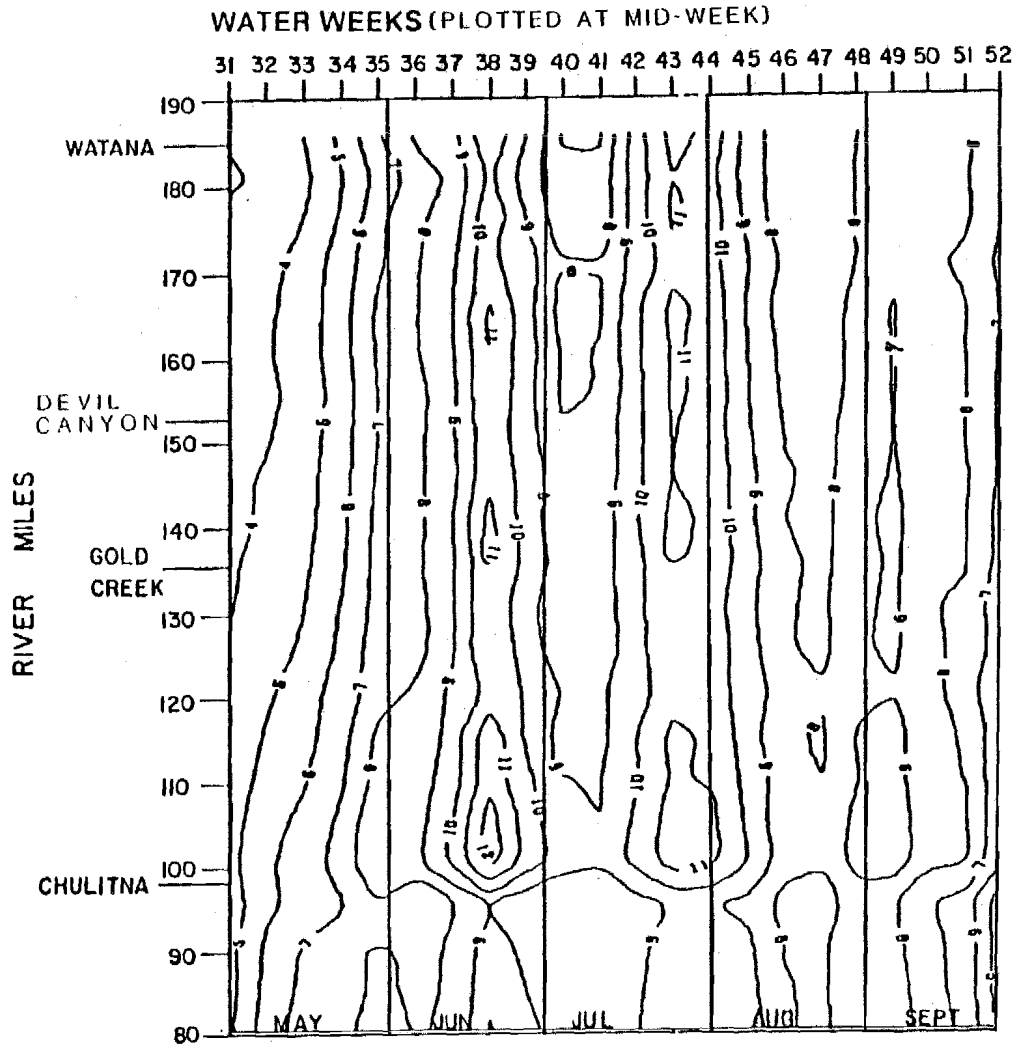
WATER WEEK NO.

River Mile	August				September				October				
	45	46	47	48	49	50	51	52	1	2	3	4	5
184 1/	8.7	9.0	9.7	8.4	9.0	9.1	8.5	8.1	7.6	6.7	5.7	4.6	3.9
173	9.0	9.2	9.9	8.5	8.9	8.8	8.0	7.7	7.0	6.1	5.0	3.5	3.2
162	9.3	9.4	10.1	8.7	8.9	8.8	8.0	7.6	6.9	5.8	4.6	2.8	2.6
150 2/	9.7	9.7	10.3	8.9	9.0	8.7	7.9	7.6	6.7	5.7	4.3	2.3	2.3
140	9.9	9.9	10.5	9.0	9.0	8.7	7.8	7.4	6.5	5.4	4.0	1.8	1.9
130	10.0	9.9	10.5	9.0	8.9	8.5	7.6	7.2	6.2	5.1	3.6	1.2	1.4
120	10.4	10.2	10.8	9.3	9.0	8.5	7.6	7.2	6.1	4.8	3.2	0.5	0.8
110	10.7	10.5	11.1	9.5	9.1	8.6	7.7	7.1	6.0	4.7	2.9	0.0	0.4
99 3/	11.1	10.8	11.4	9.8	9.2	8.7	7.7	7.1	5.8	4.4	2.6	0.0	0.0
98 4/	8.9	8.6	9.1	7.7	7.6	6.9	5.7	5.8	4.2	3.6	2.2	0.4	0.3
84 5/	9.6	9.3	9.7	8.3	7.8	7.0	5.9	5.5	3.6	3.1	1.6	0.0	0.0

1/ Downstream of Watana Dam Site
2/ Downstream of Devil Canyon Dam Site
3/ Upstream of Susitna - Chulitna confluence
4/ Downstream of Susitna - Chulitna confluence (full mixing assumed)
5/ At Sunshine stream gaging station at Parks Highway Bridge

420723
840817

MIDDLE SUSITNA RIVER - ISOTHERMS



WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1981 CLIMATE DATA

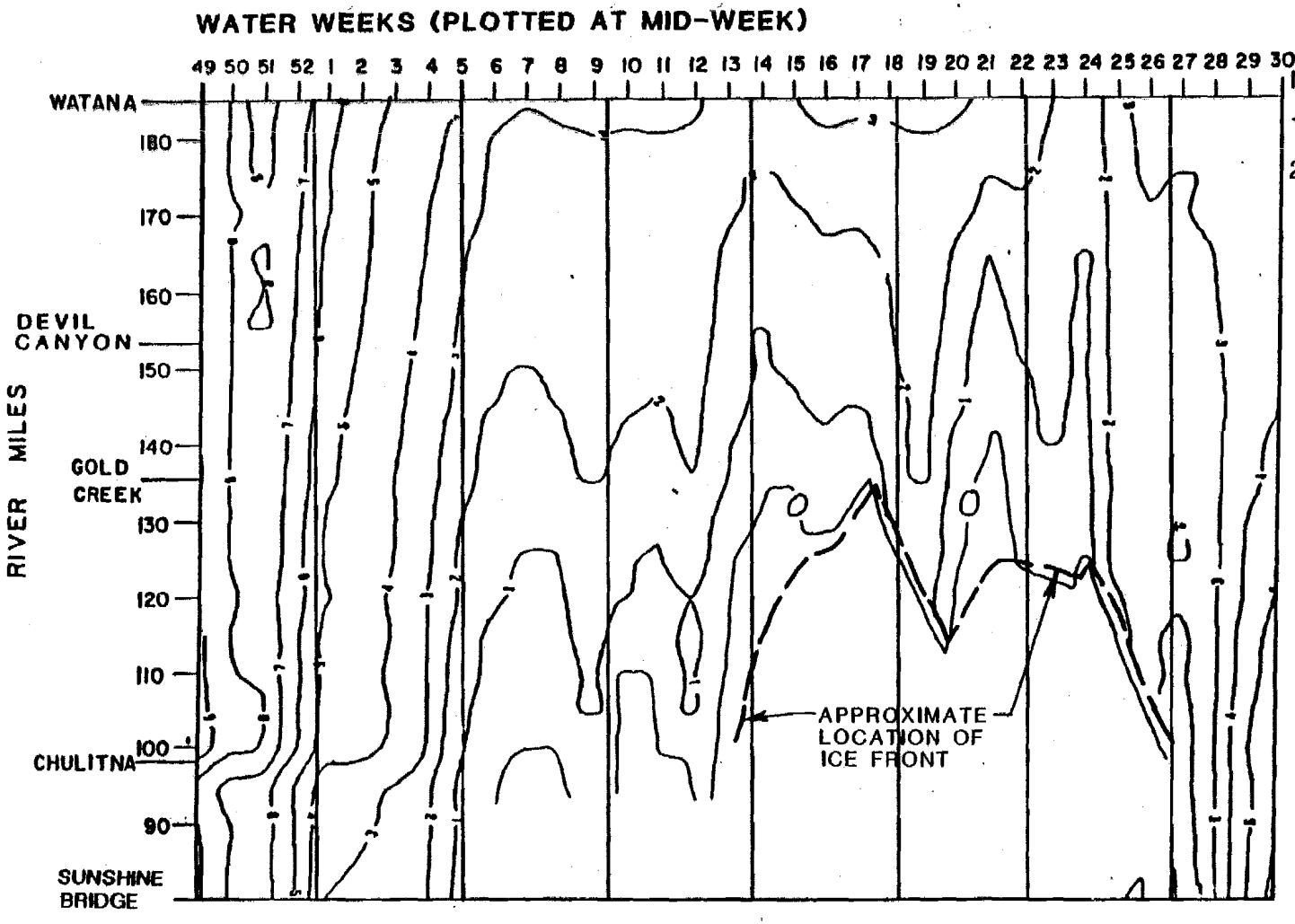
NOTES :

1. TEMPERATURES IN °C.

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS

WATANA ONLY, 2001 ENERGY DEMAND

WINTER 1981-1982 CLIMATE DATA

CASE C FLOW REQUIREMENTS

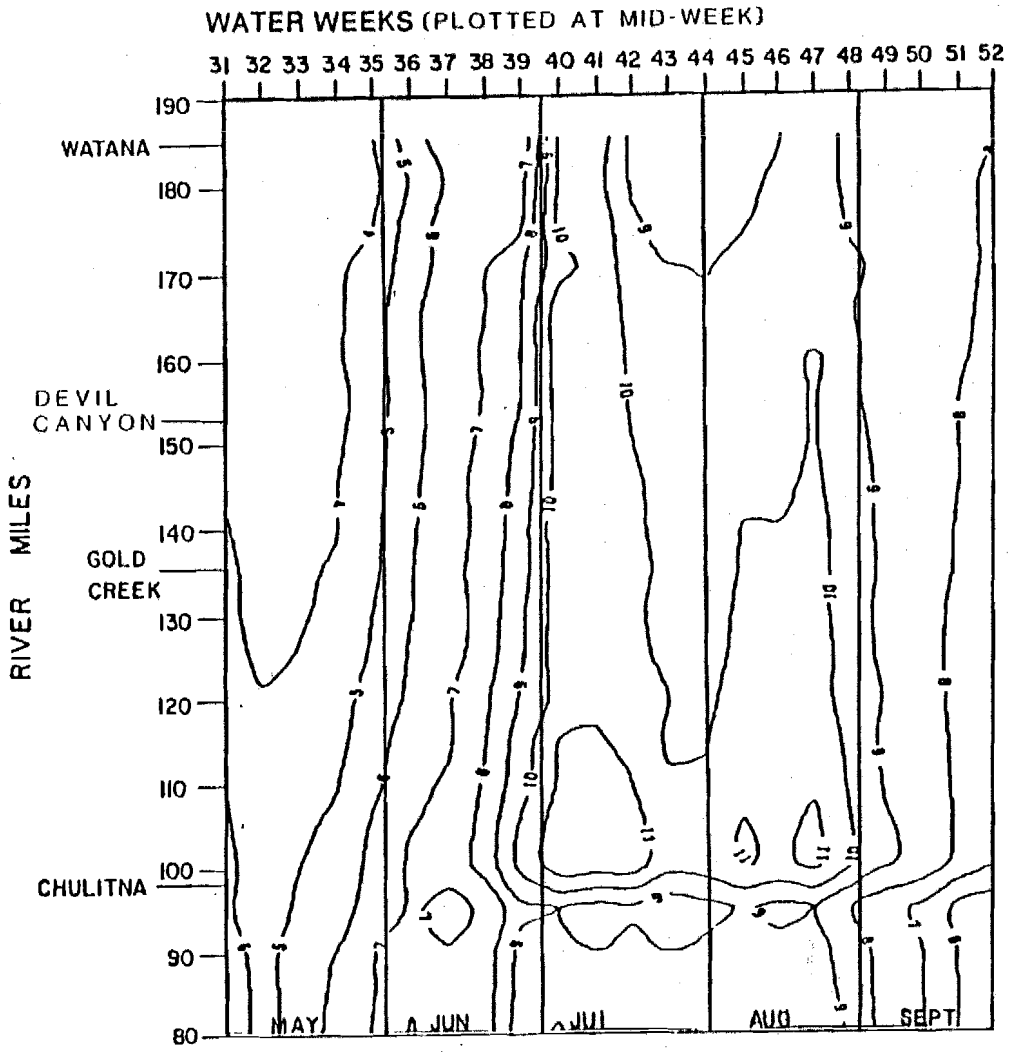
ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

MIDDLE SUSITNA RIVER ISOTHERMS

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS



TIME

WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1982 CLIMATE DATA

NOTES :

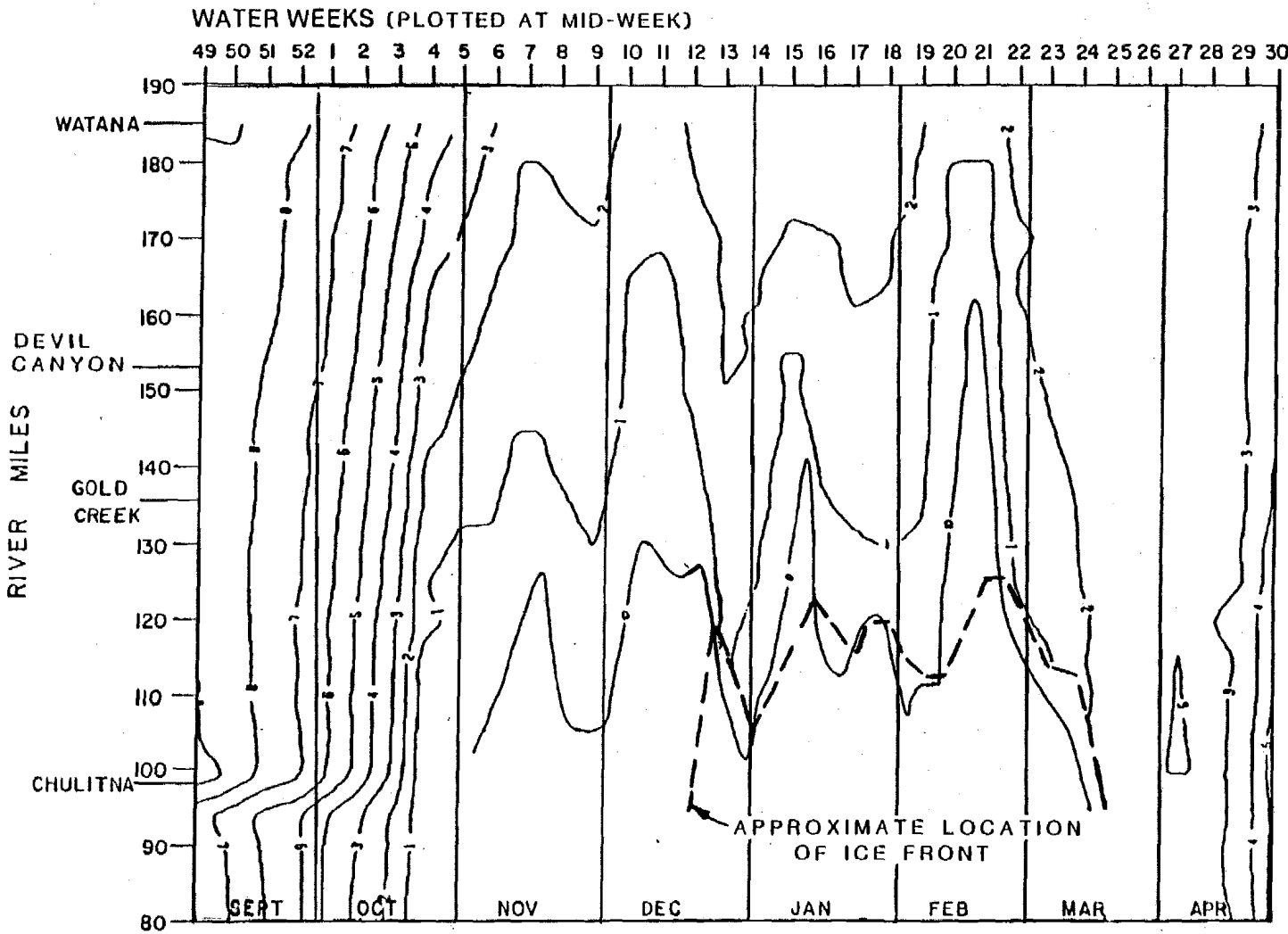
1. TEMPERATURES IN °C.

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

WATANA ONLY, 2001 ENERGY DEMAND

WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

Exhibit G-5

A COMPARISON OF SIMULATED RIVER TEMPERATURES

AT RIVER MILES 100, 130, and 150

FOR

CASE C AND CASE E-VI FLOW REQUIREMENTS

—

PROJECTED ENERGY DEMANDS FOR - YEAR 2001

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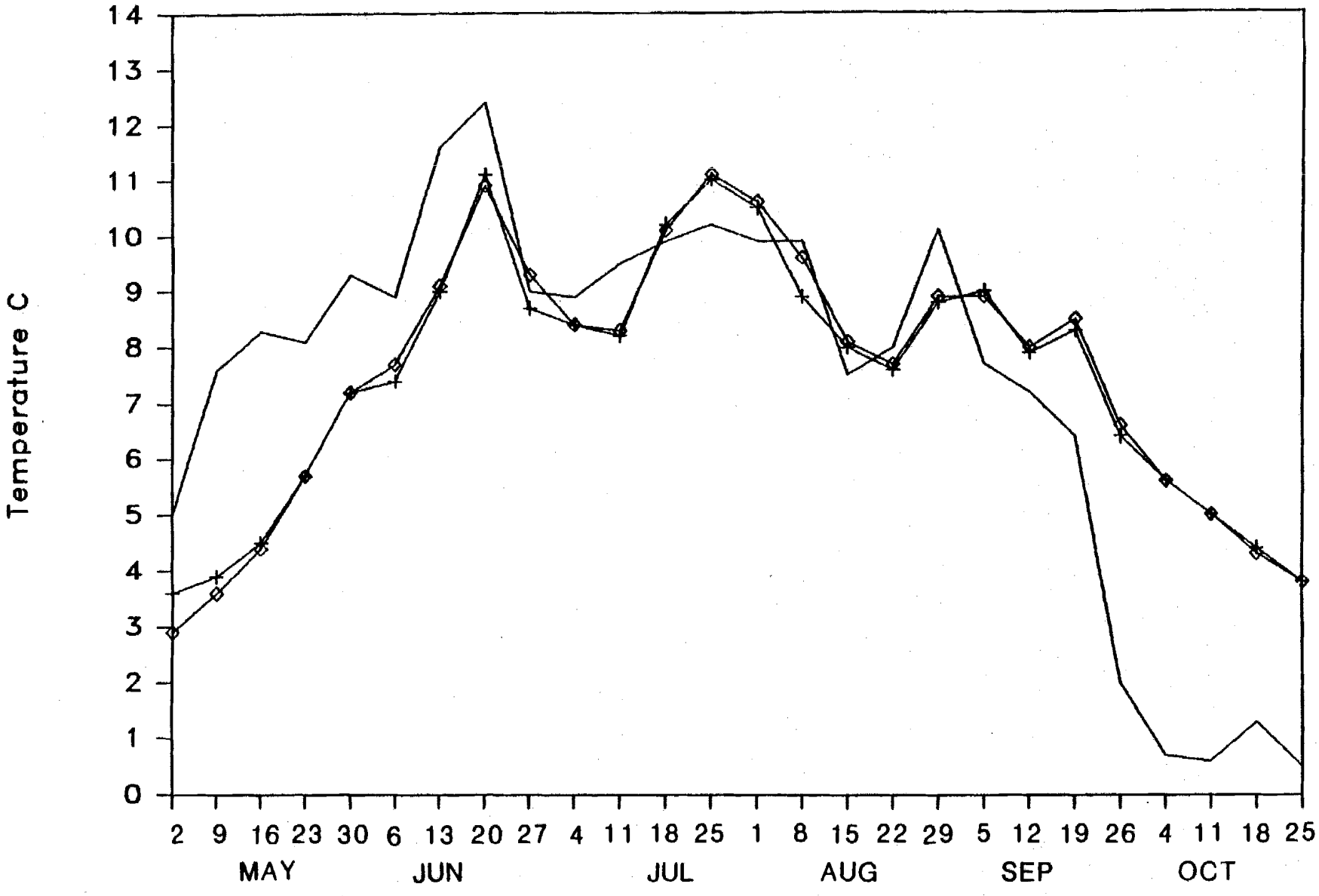
Note: Simulations are based on hydrologic and meteorologic data from the period May 1981 to September 1982.

SUSITNA RIVER TEMPERATURES

1981 RM 150



SIMULATED TEMPERATURES
AT RIVER MILE 150
1981 WEATHER
2001 ENERGY DEMANDS

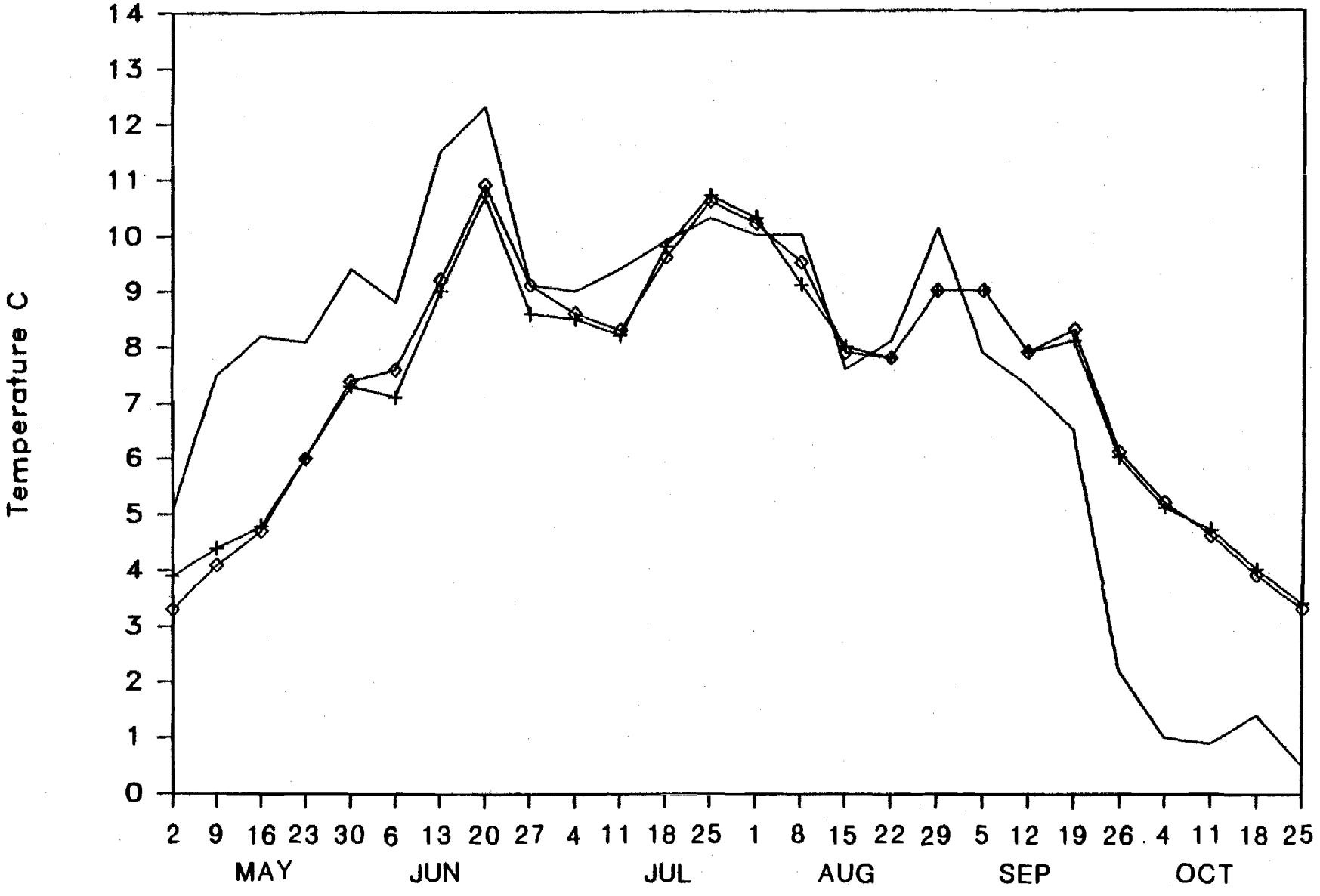
——— NATURAL CONDITIONS
x CASE C FLOW REQUIREMENTS
◇ CASE E-VI FLOW REQUIREMENTS

HARZA-EBASCO SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

SUSITNA RIVER TEMPERATURES

1981 RM 130



SIMULATED TEMPERATURES
AT RIVER MILE 130
1981 WEATHER
2001 ENERGY DEMANDS

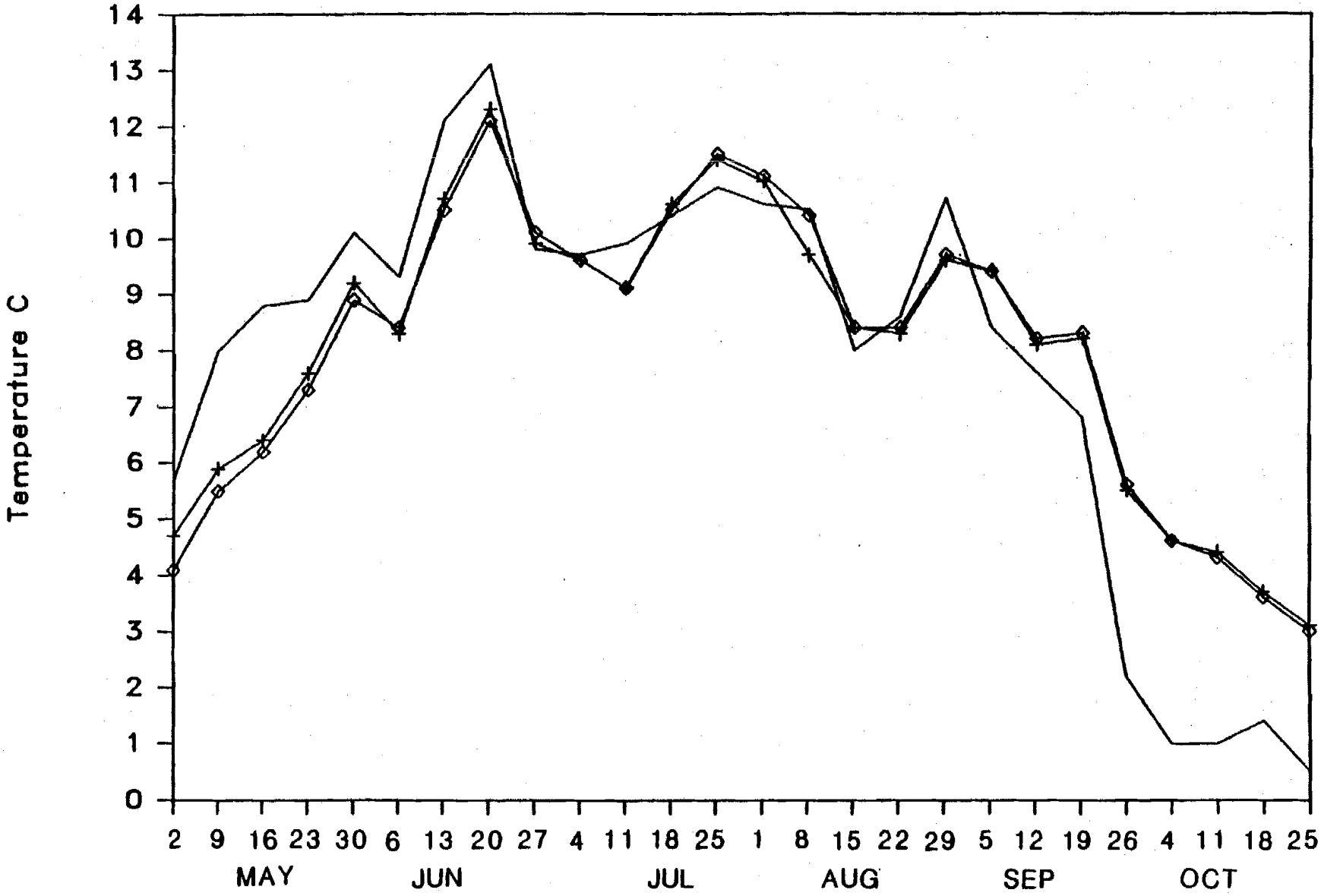
——— NATURAL CONDITIONS
x CASE C FLOW REQUIREMENTS
◇ CASE E-VI FLOW REQUIREMENTS

HARZA-EBASCO SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

SUSITNA RIVER TEMPERATURES

1981 RM 100



SIMULATED TEMPERATURES
AT RIVER MILE 100
1981 WEATHER
2001 ENERGY DEMANDS

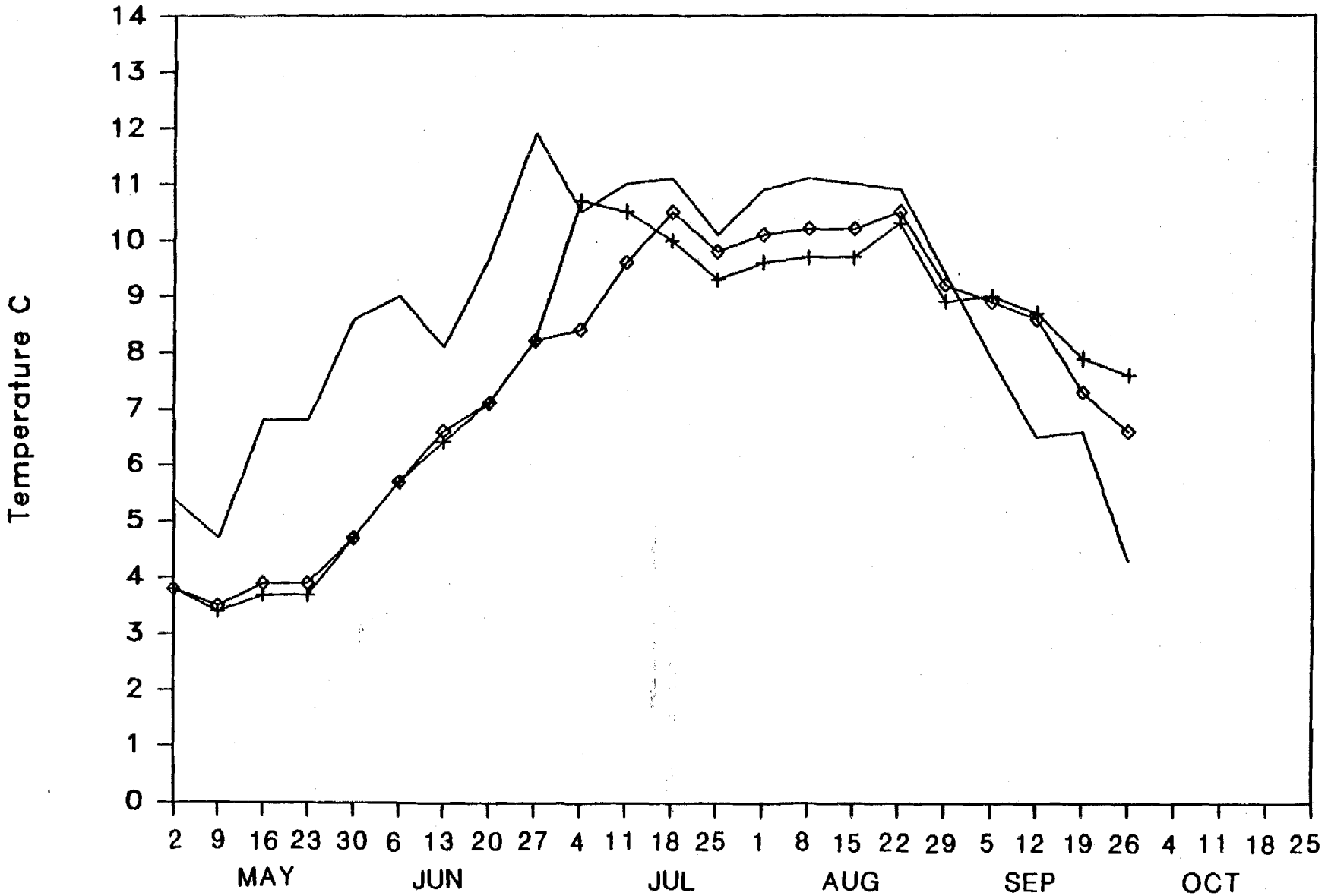
——— NATURAL CONDITIONS
x CASE C FLOW REQUIREMENTS
◇ CASE E-VI FLOW REQUIREMENTS

HARZA-EBASCO SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

SUSITNA RIVER TEMPERATURES

1982 RM 150



SIMULATED TEMPERATURES
AT RIVER MILE 150
1982 WEATHER
2001 ENERGY DEMANDS

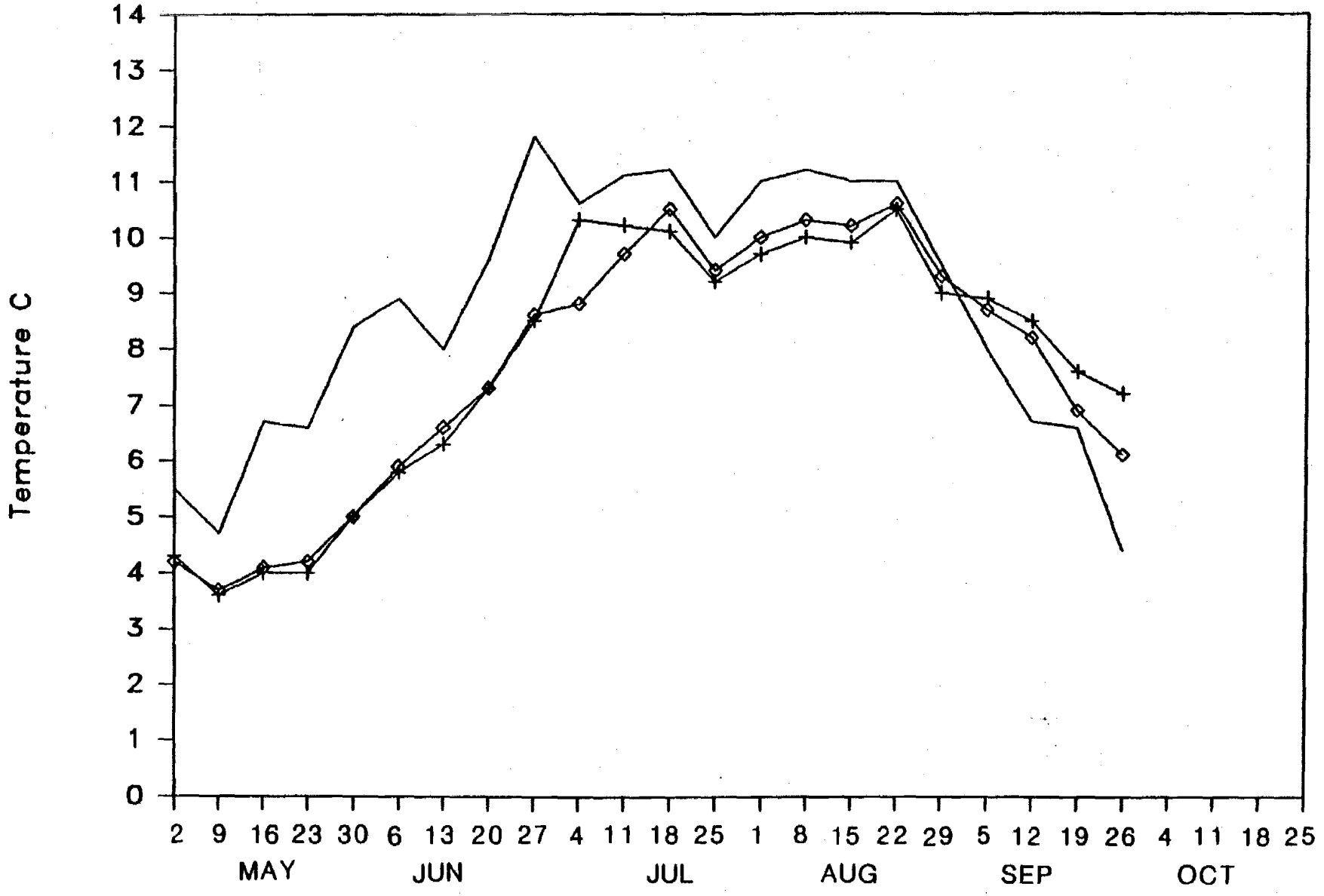
——— NATURAL CONDITIONS
x CASE C FLOW REQUIREMENTS
◇ CASE E-VI FLOW REQUIREMENTS

HARZA-EBASCO SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

SUSITNA RIVER TEMPERATURES

1982 RM 130



SIMULATED TEMPERATURES
AT RIVER MILE 130
1982 WEATHER
2001 ENERGY DEMANDS

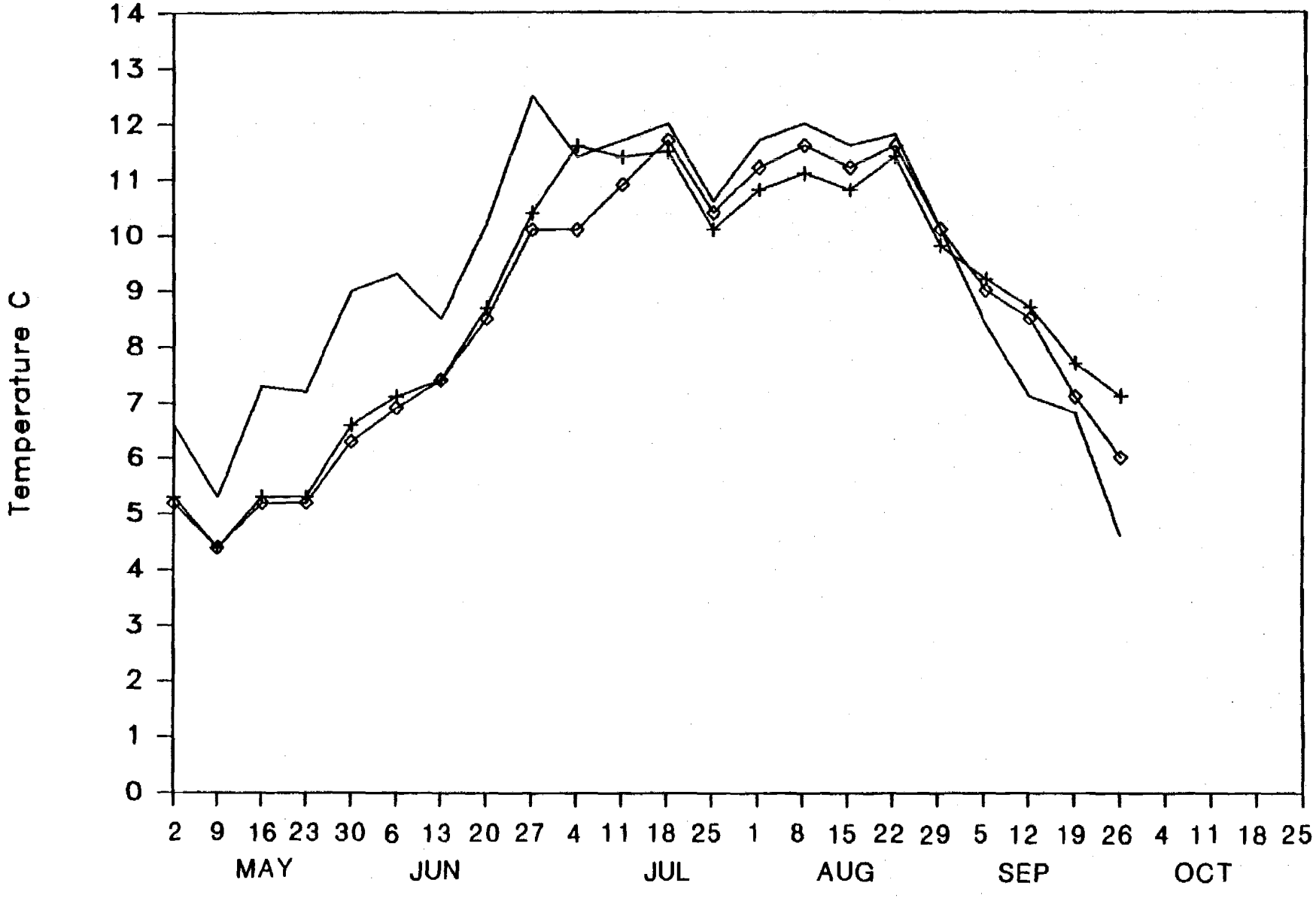
——— NATURAL CONDITIONS
x CASE C FLOW REQUIREMENTS
◇ CASE E-VI FLOW REQUIREMENTS

HARZA-EBASCO SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

SUSITNA RIVER TEMPERATURES

1982 RM 100



SIMULATED TEMPERATURES
AT RIVER MILE 100
1982 WEATHER
2001 ENERGY DEMANDS

——— NATURAL CONDITIONS
x CASE C FLOW REQUIREMENTS
◇ CASE E-VI FLOW REQUIREMENTS

HARZA-EBASCO SUSITNA JOINT VENTURE

ALASKA POWER AUTHORITY

Exhibit G-6

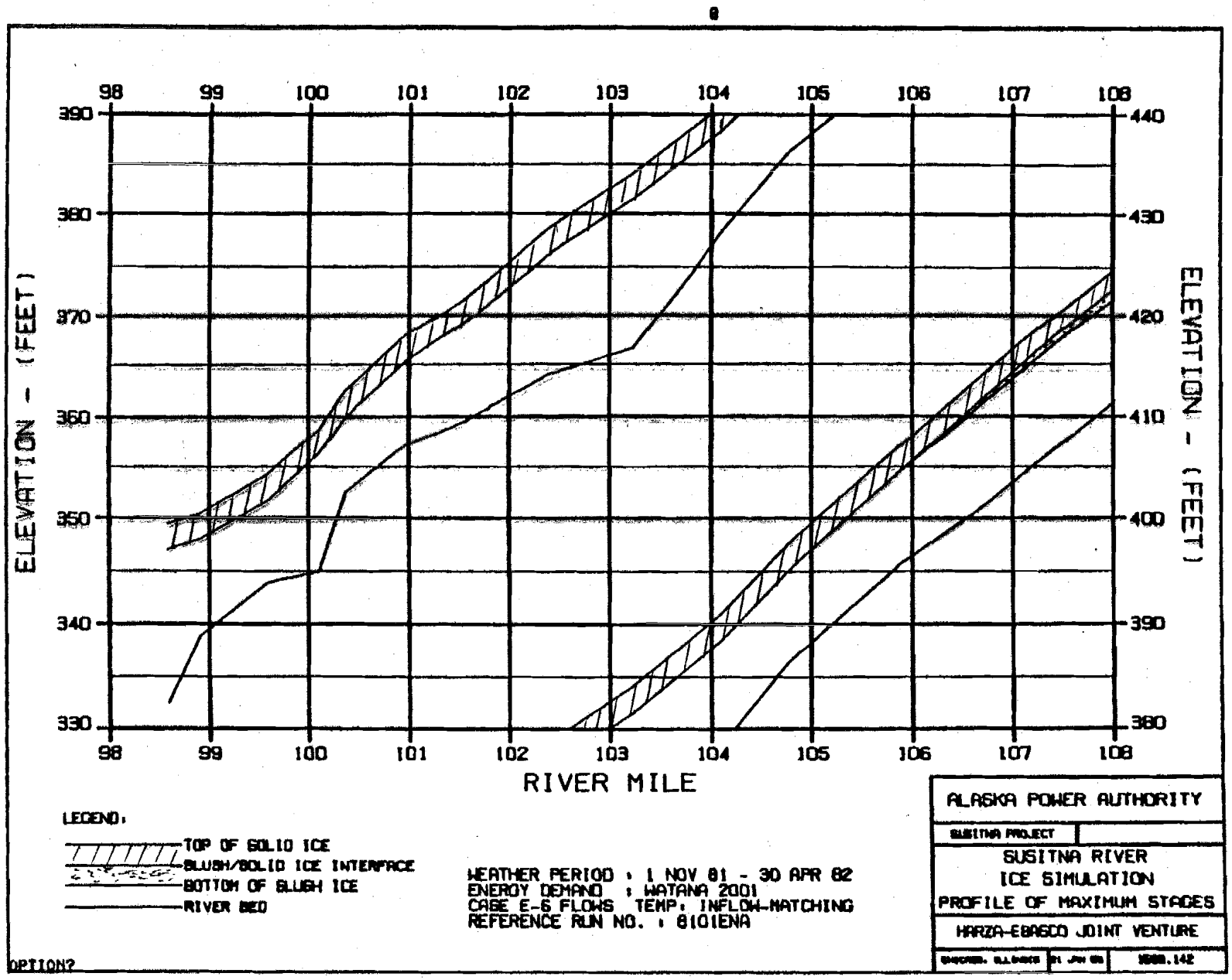
CASE E-VI RIVER ICE SIMULATIONS

FOR

PROJECTED ENERGY DEMANDS - YEAR 2001

- Profiles of Maximum Stages (5 sheets)
- Progression of Ice Front and Zero Degree Isotherm (1 sheet)
- Time History (22 locations)

Note: Simulations are based on hydrologic and meteorologic data from the period November 1981 to May 1982.


98
99
100
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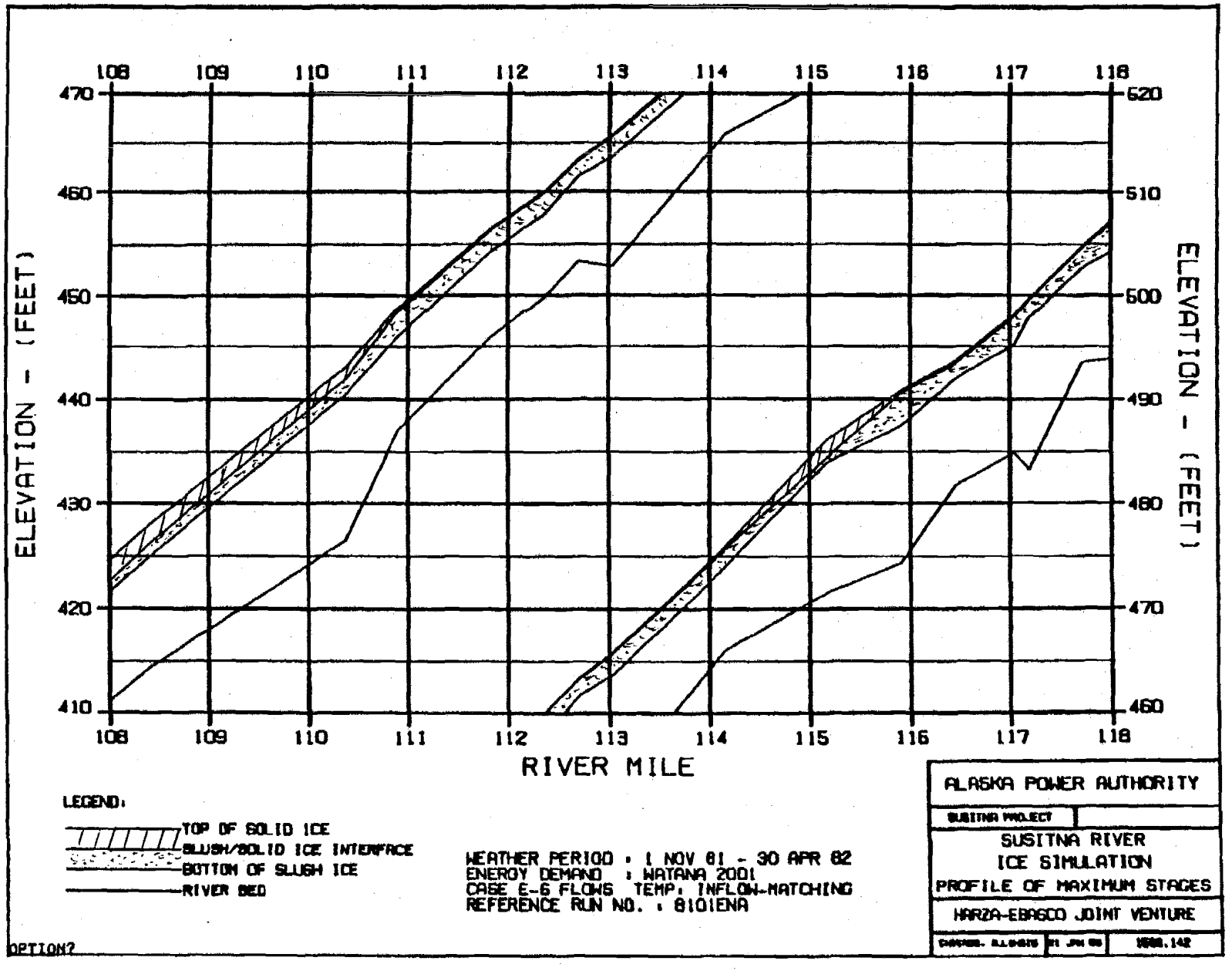
102
103
104
105
106
107
108
390
380
370
360
350
340
330
440
430
420
410
400
390
380
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
OPTION?

C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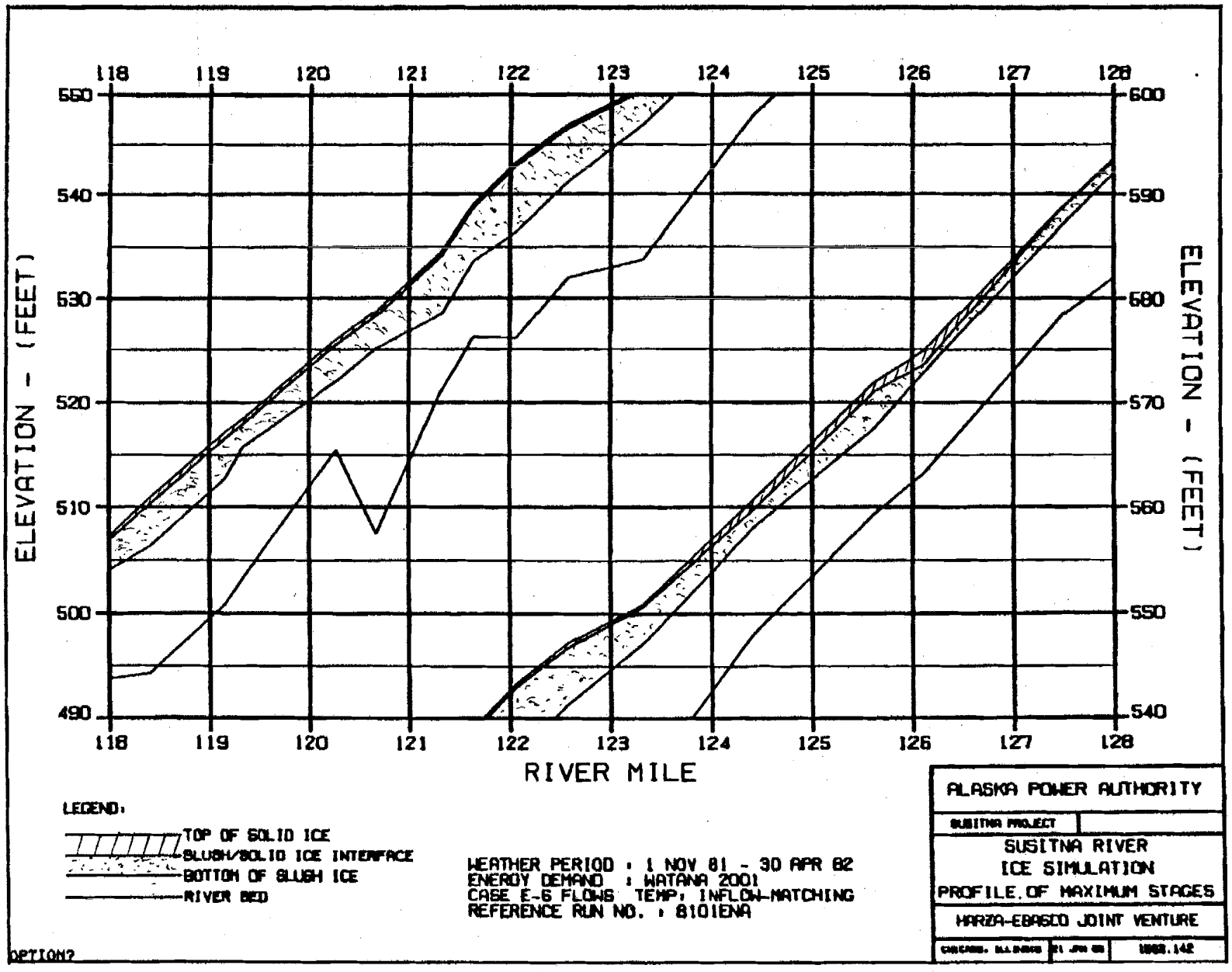
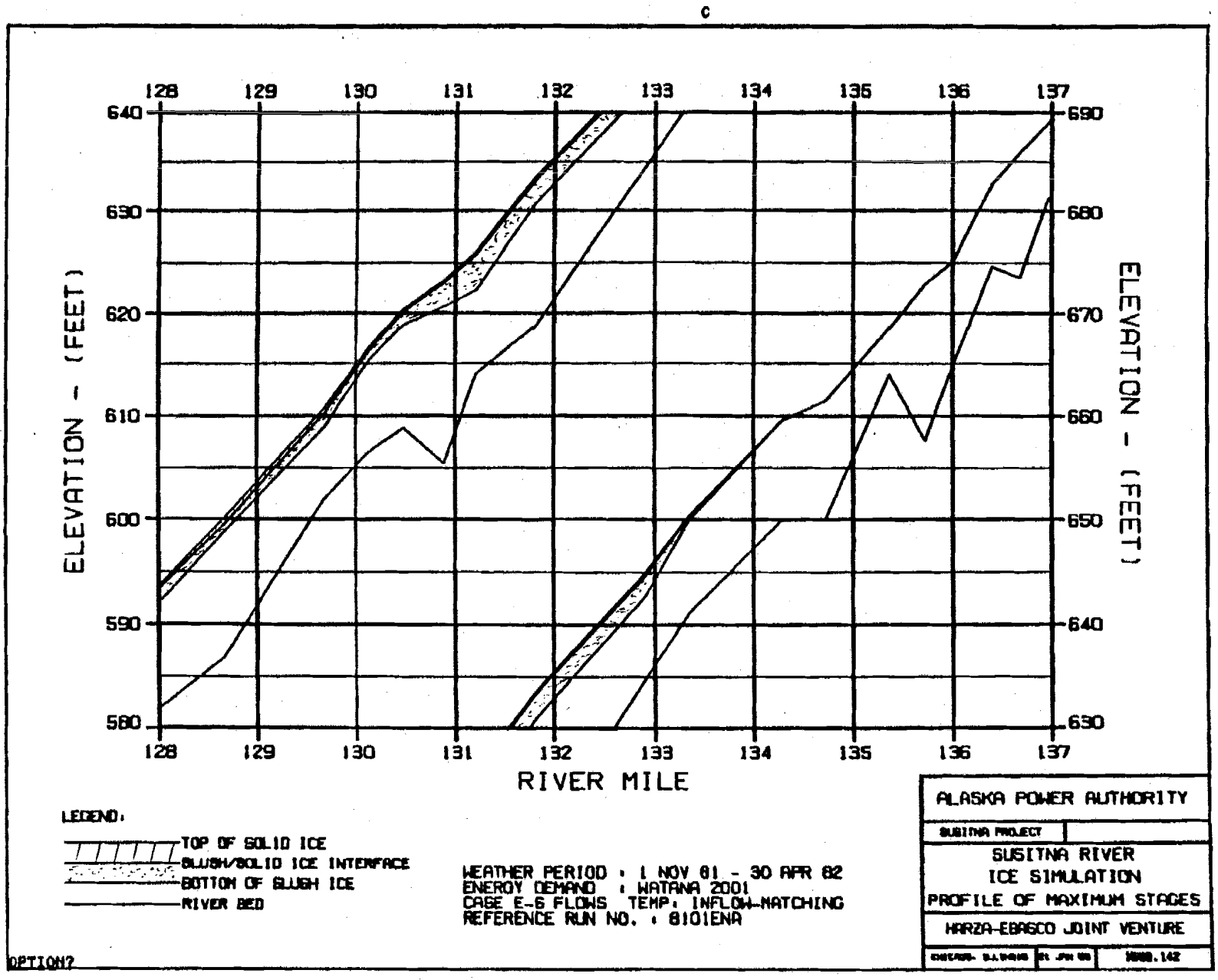
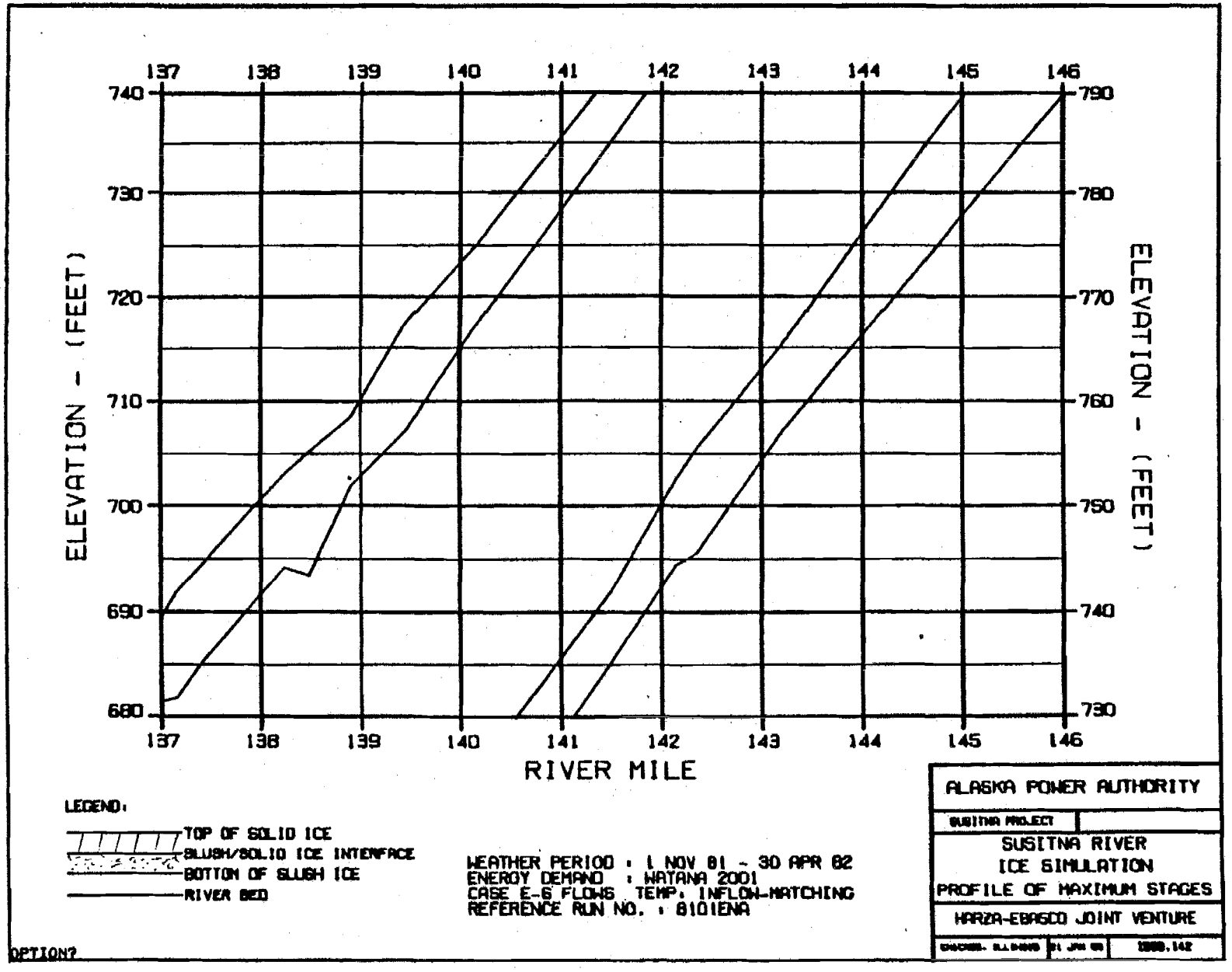
113
114
115
116
117
118
470
460
450
440
430
420
410
520
510
500
490
480
470
460
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
OPTION2

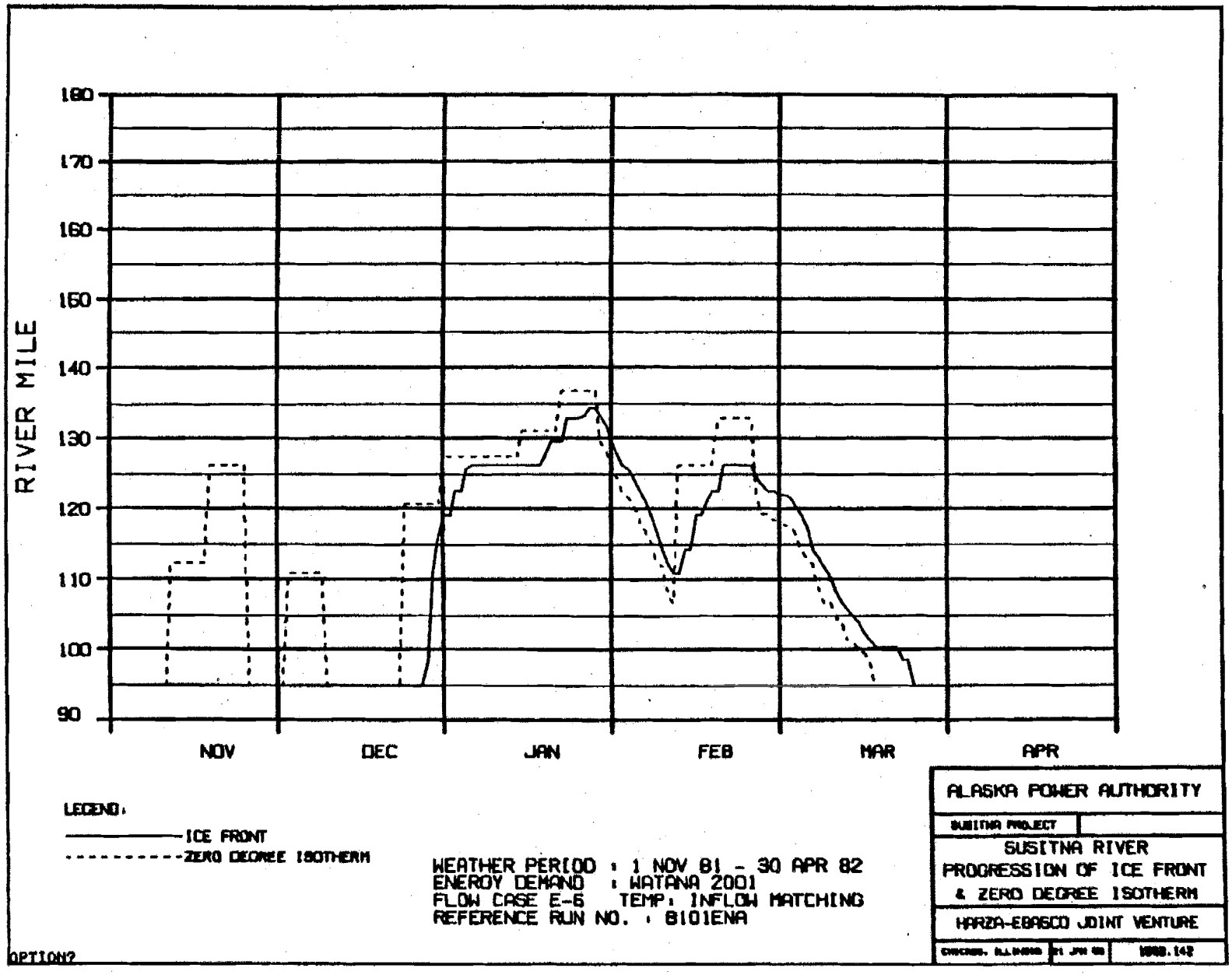
C

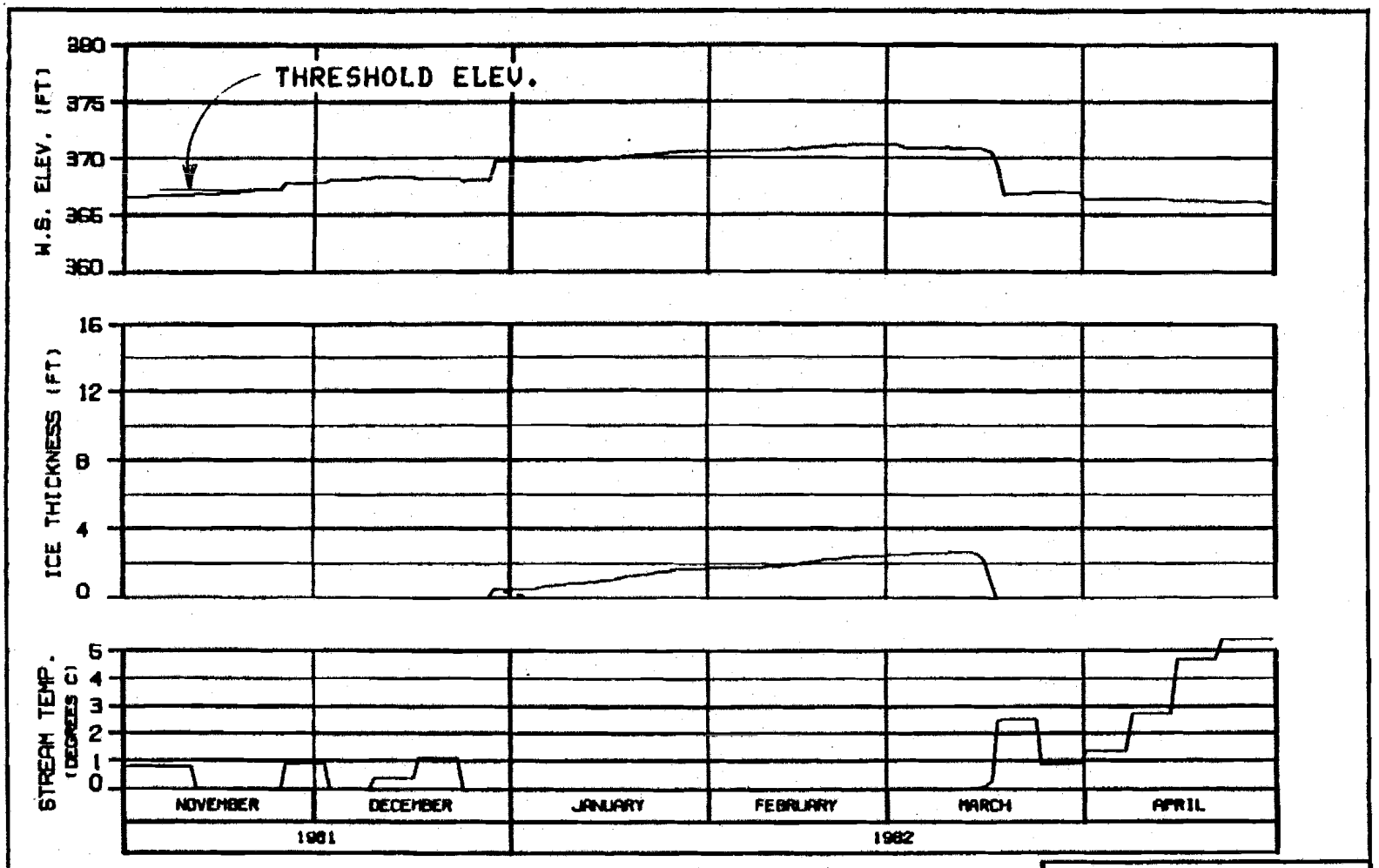

118
119
120
121
122
123
124
125
126
127
128
560
540
530
520
510
500
490
600
590
580
570
560
550
540
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
1868.142
OPTION2


C
128
129
130
131
132
133
134
135
136
137
640
630
620
610
600
590
580
690
680
670
660
650
640
630
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
OPTION?


137
138
139
140
141
142
143
144
145
146
740
730
720
710
700
690
680
790
780
770
760
750
740
730
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81013NA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
OPTION?

C


180
170
160
150
140
130
120
110
100
90
RIVER MILE
NOV
DEC
JAN
FEB
MAR
APR
LEGEND:
ICE FRONT
ZERO DEGREE ISOTHERM
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
FLOW CASE E-6 TEMP: INFLOW MATCHING
REFERENCE RUN NO. : 8101ENA
OPTION2
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
PROGRESSION OF ICE FRONT
& ZERO DEGREE ISOTHERM
HARZA-EBASCO JOINT VENTURE



HEAD OF WHISKERS SLOUGH

RIVER MILE : 101.50

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS
- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

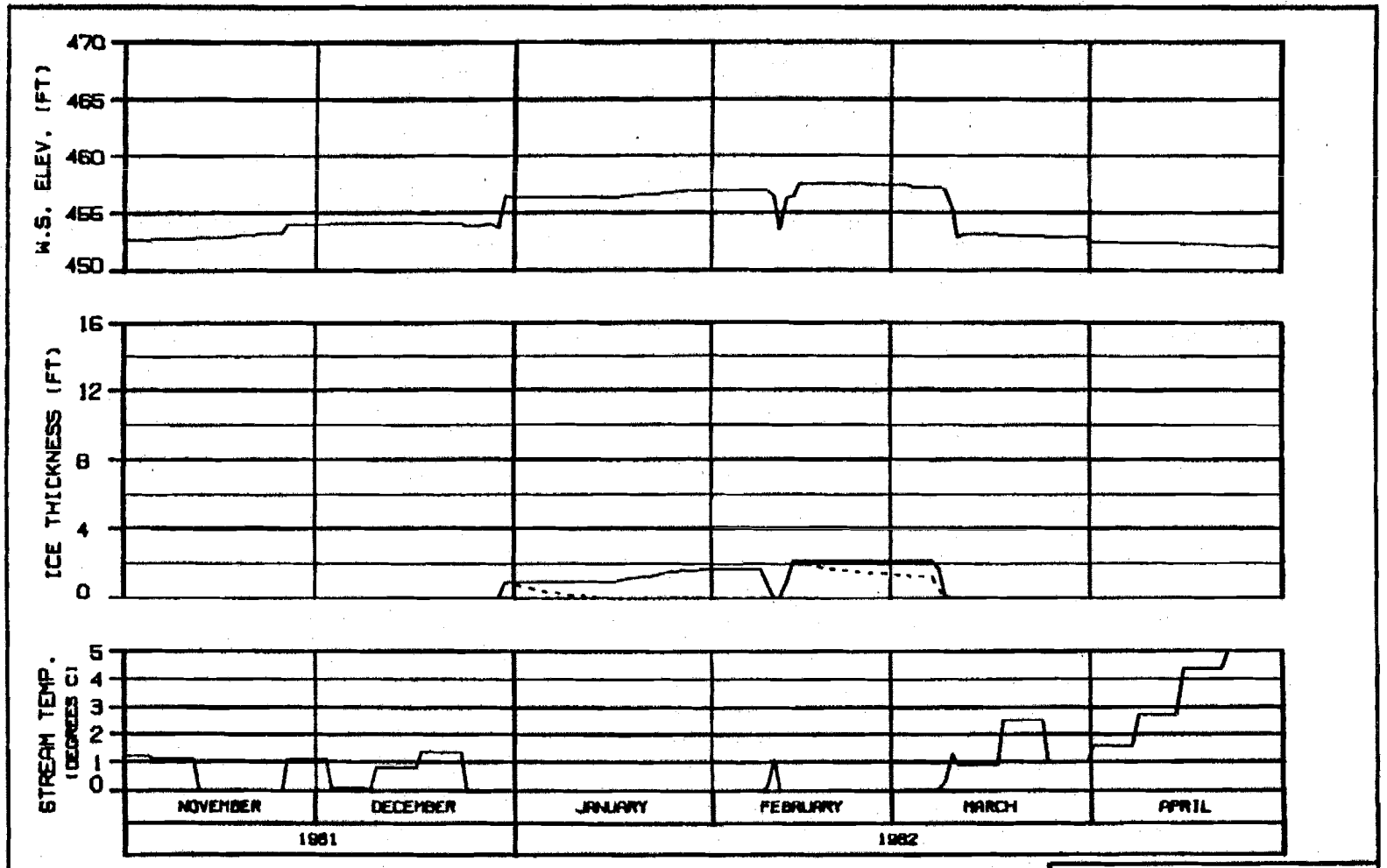
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

[illegible] 1988.142



SIDE CHANNEL AT HEAD OF GASH CREEK

RIVER MILE : 112.00

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

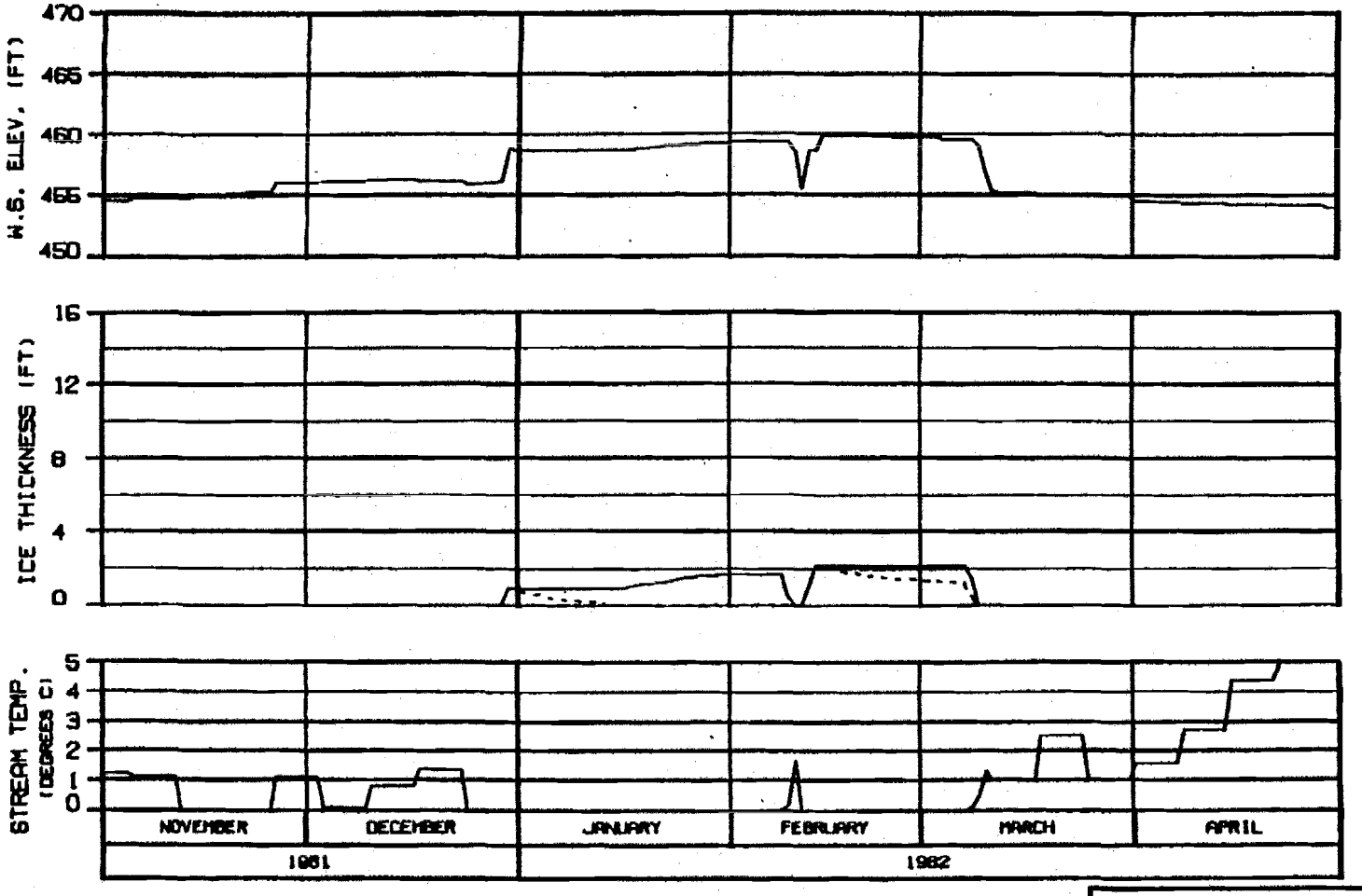
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 21 JAN 83 | 10000.142



MOUTH OF SLOUGH 6A

RIVER MILE : 112.34

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81010NA

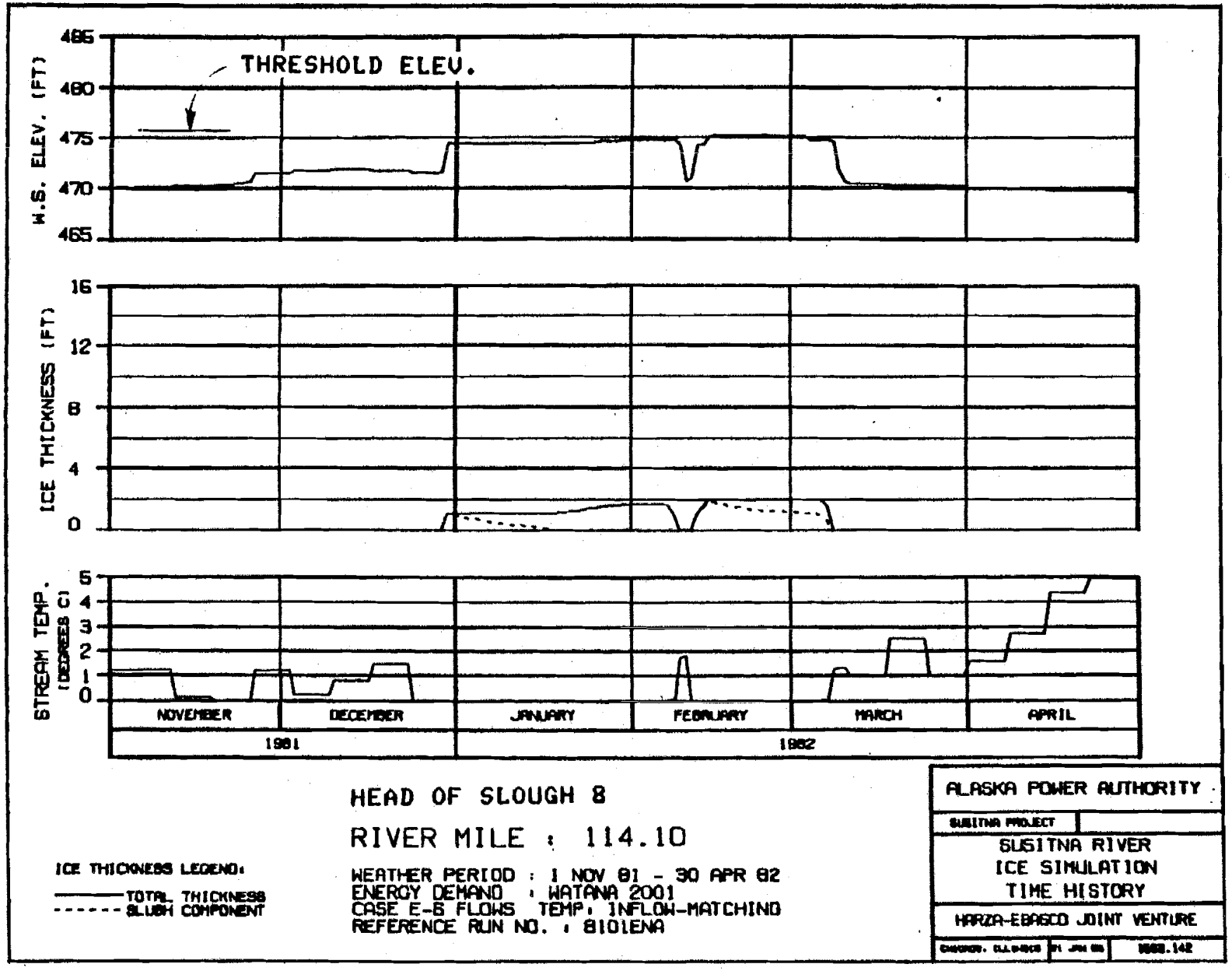
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

[illegible] ILLINOIS | 21 JAN 83 | 1588.142



HEAD OF SLOUGH 8

RIVER MILE : 114.10

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

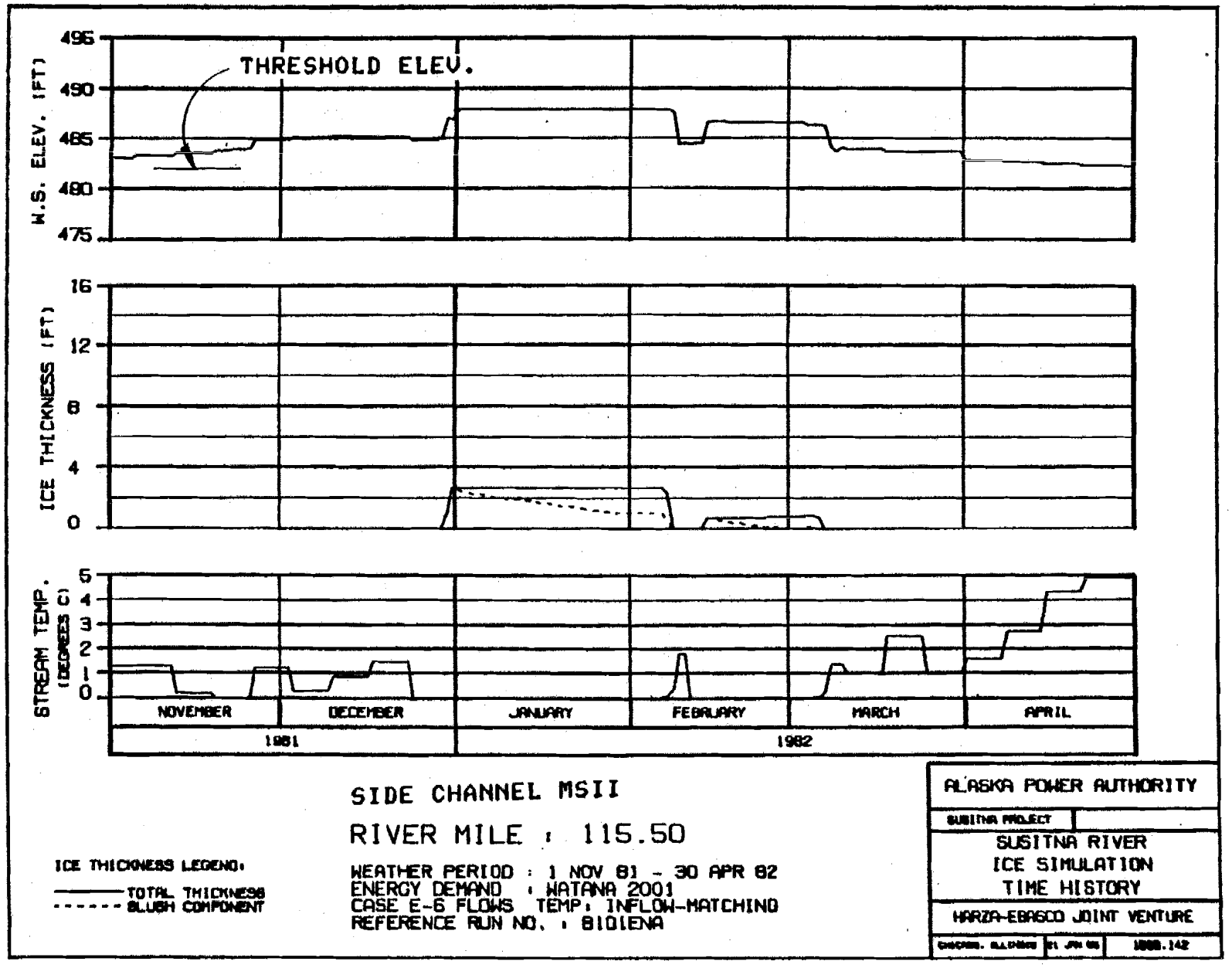
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE



SIDE CHANNEL MSII

RIVER MILE : 115.50

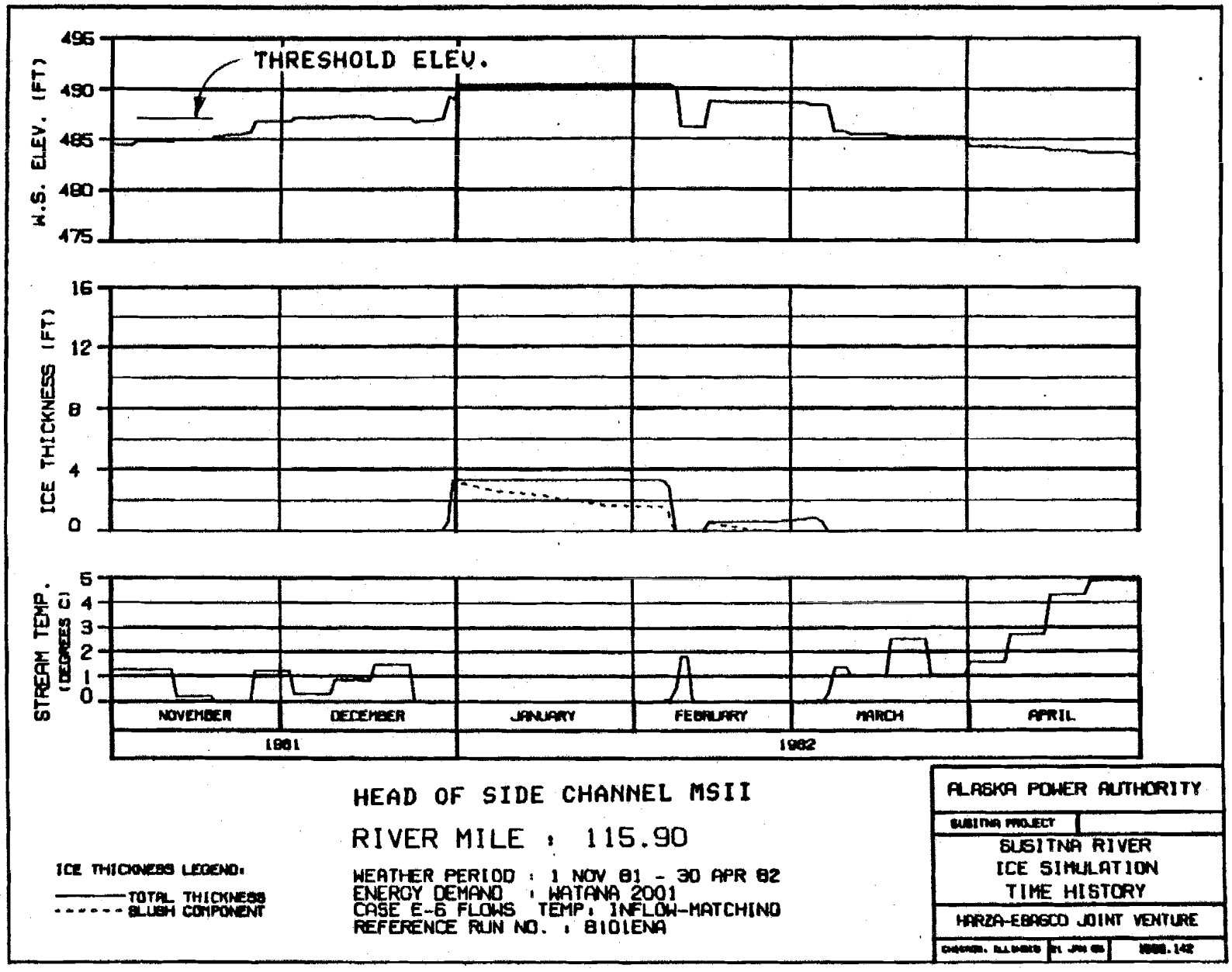
ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81DIENA

ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER ICE SIMULATION TIME HISTORY
HARZA-EBASCO JOINT VENTURE
1988.142



HEAD OF SIDE CHANNEL MSII

RIVER MILE : 115.90

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

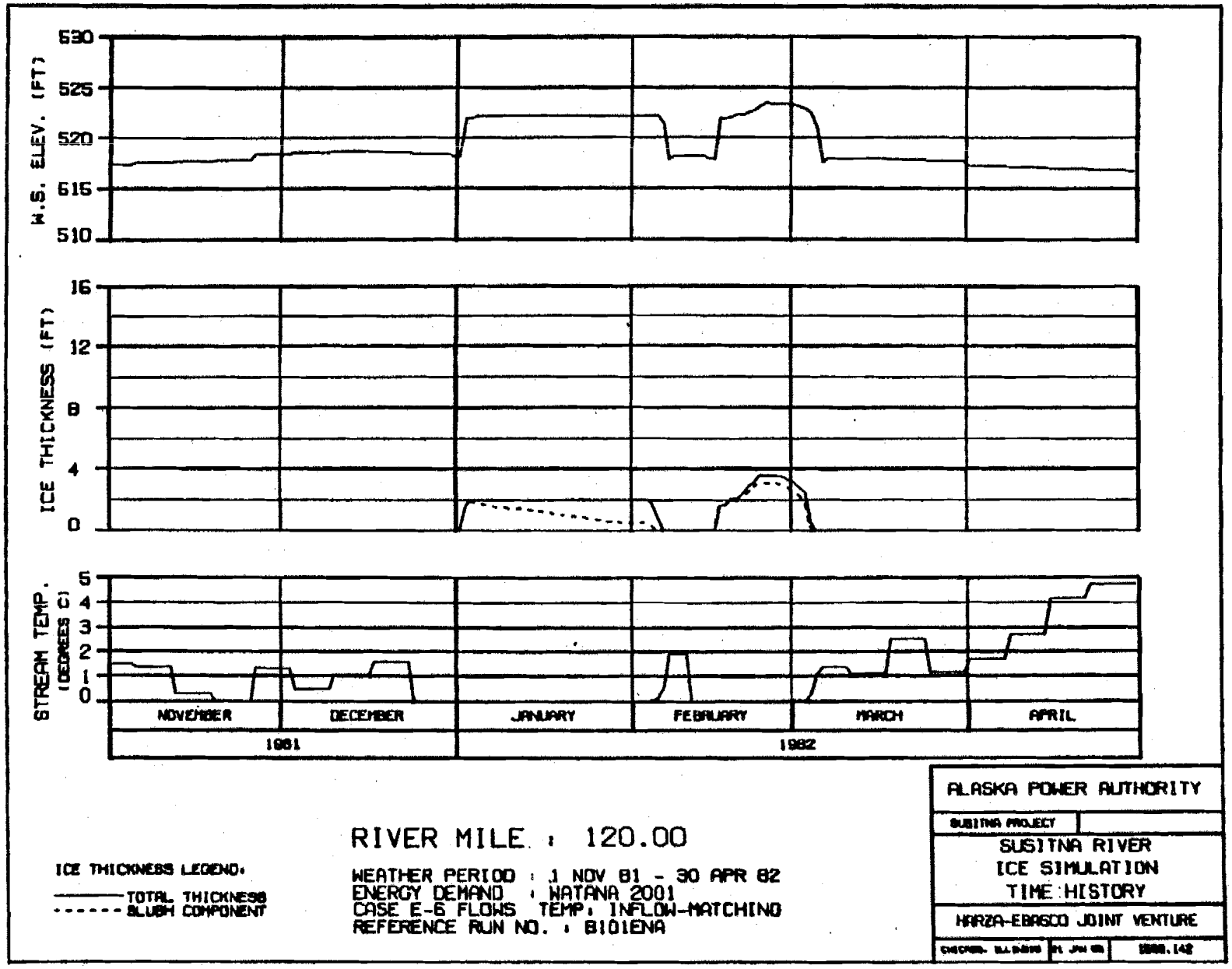
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 810LENA

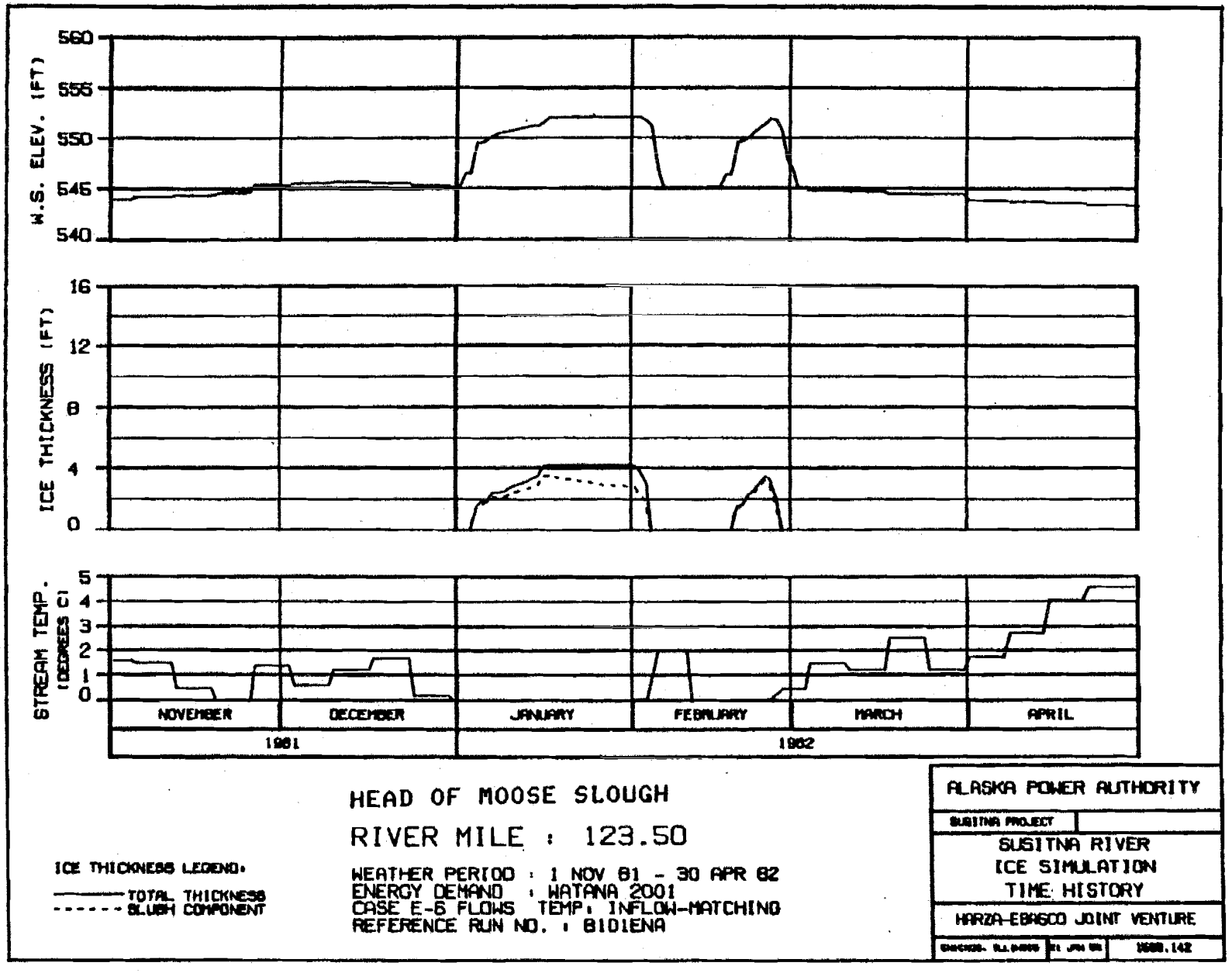
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE


W.S. ELEV. (FT)
530
525
520
515
510
ICE THICKNESS (FT)
16
12
8
4
0
STREAM TEMP. (DEGREES C)
5
4
3
2
1
0
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
1981
1982
ICE THICKNESS LEGEND:
TOTAL THICKNESS
SLUSH COMPONENT
RIVER MILE : 120.00
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : B101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE



HEAD OF MOOSE SLOUGH

RIVER MILE : 123.50

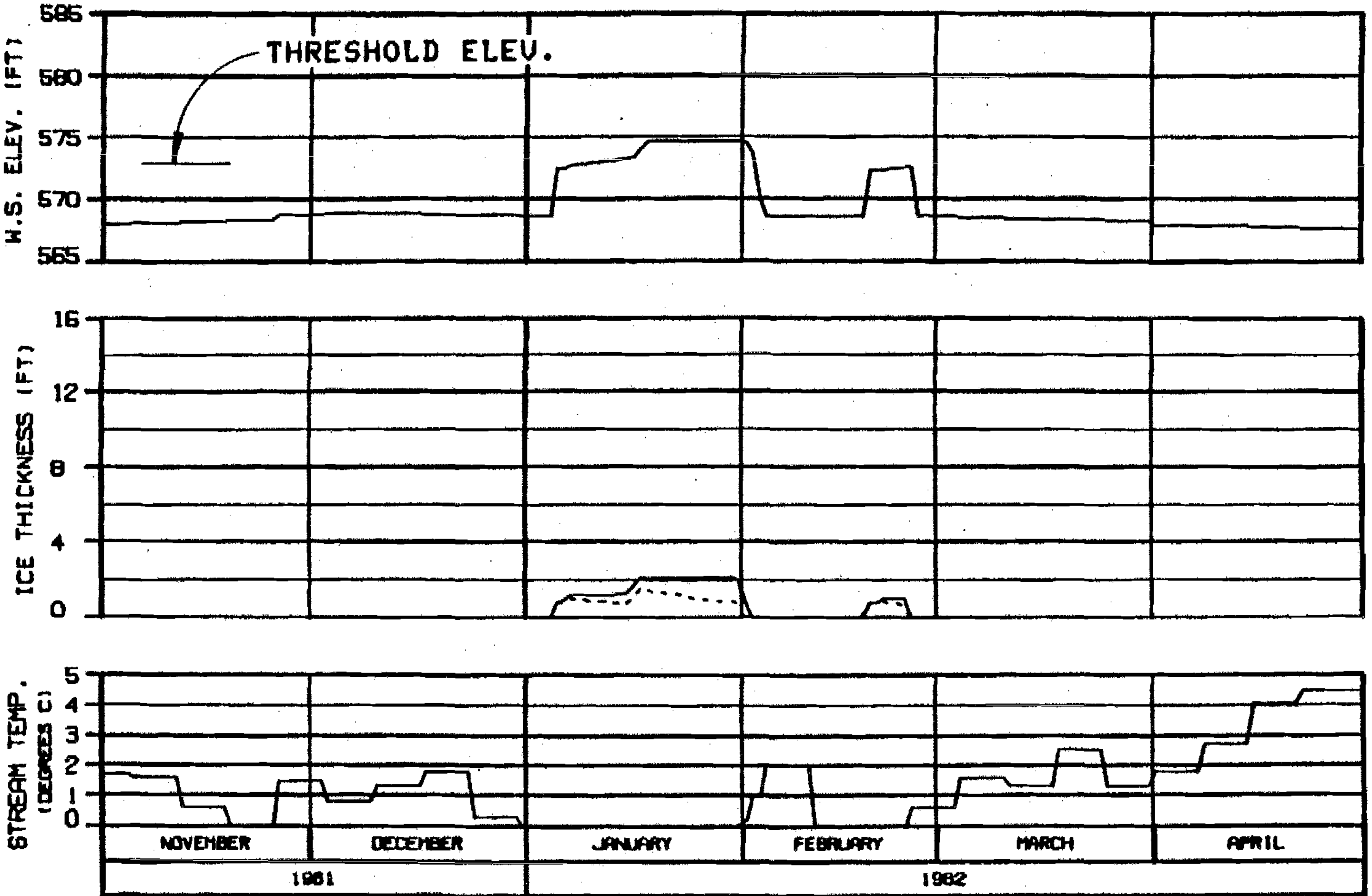
ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : BIDIENA

ALASKA POWER AUTHORITY	
SUSITNA PROJECT	
SUSITNA RIVER ICE SIMULATION TIME HISTORY	
HARZA-EBASCO JOINT VENTURE	
[illegible]	1688.142



HEAD OF SLOUGH 8A (WEST)

RIVER MILE : 126.10

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS
- - - - - - SLUSH COMPONENT

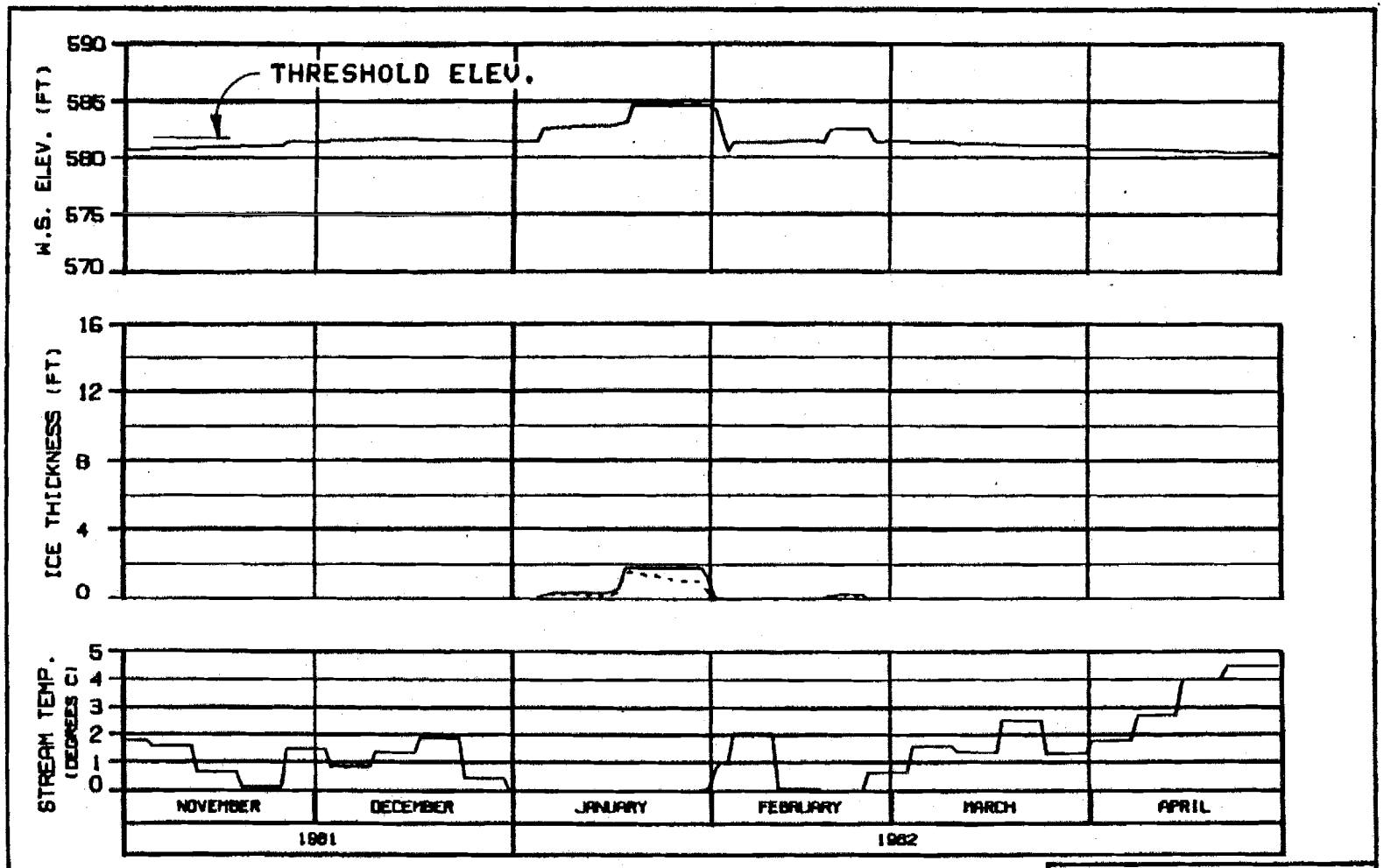
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE



HEAD OF SLOUGH 8A (EAST)

RIVER MILE : 127.10

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

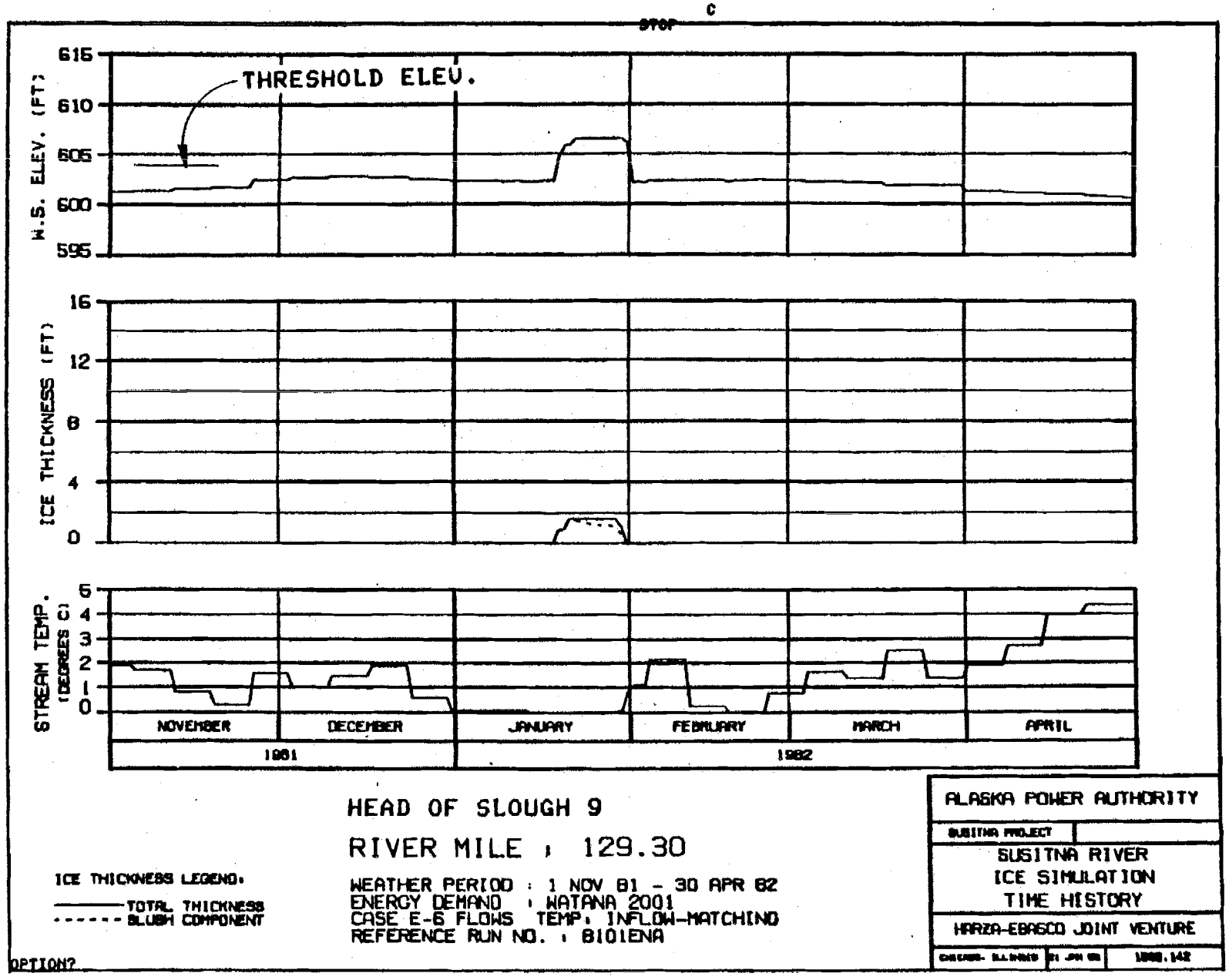
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : BIDIENA

ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE



HEAD OF SLOUGH 9

RIVER MILE : 129.30

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHIND
REFERENCE RUN NO. : B101ENA

OPTION?

ALASKA POWER AUTHORITY

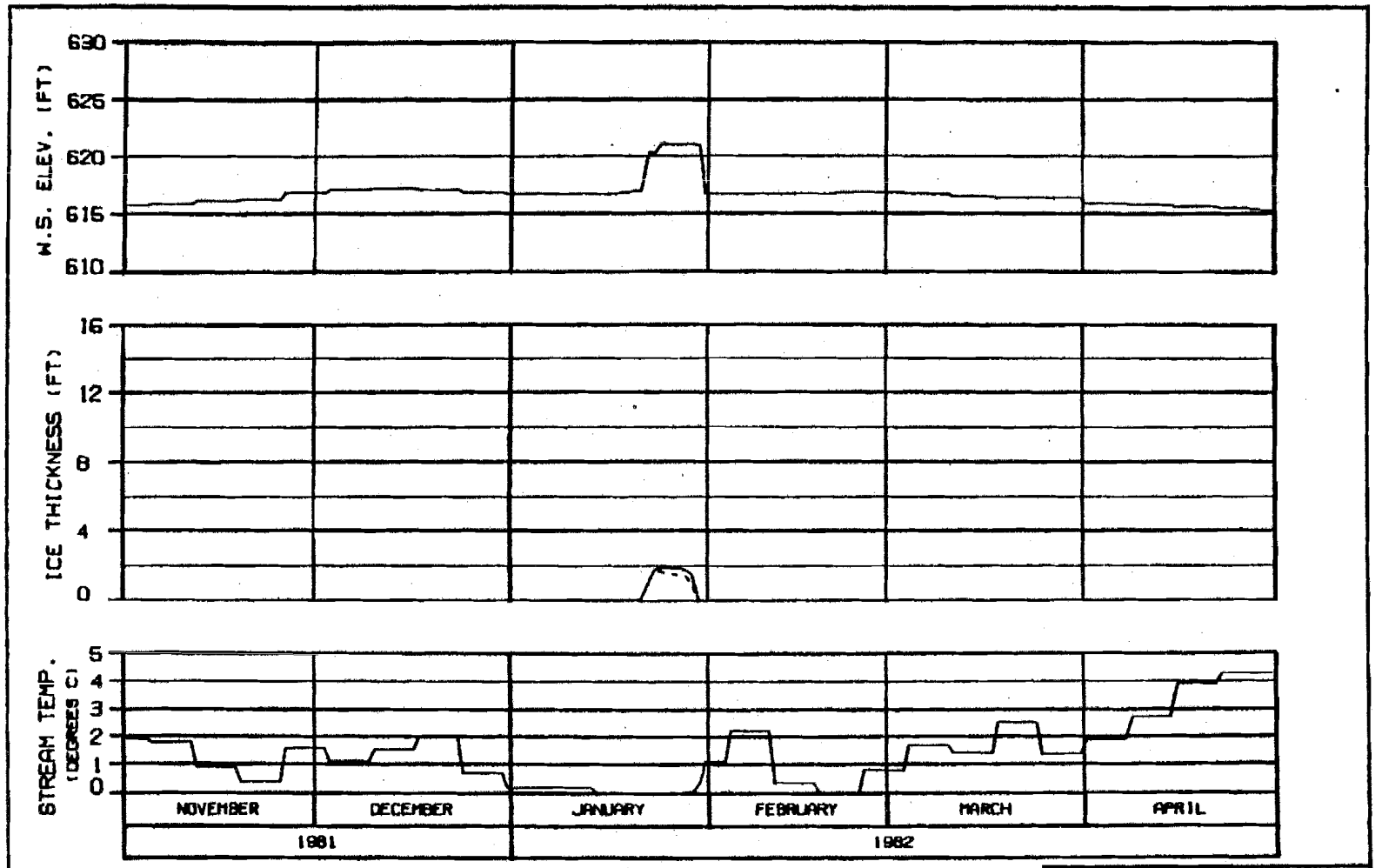
SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 21 JAN 88 | 1898.142

OPTION?



SIDE CHANNEL U/S OF SLOUGH 9

RIVER MILE : 130.60

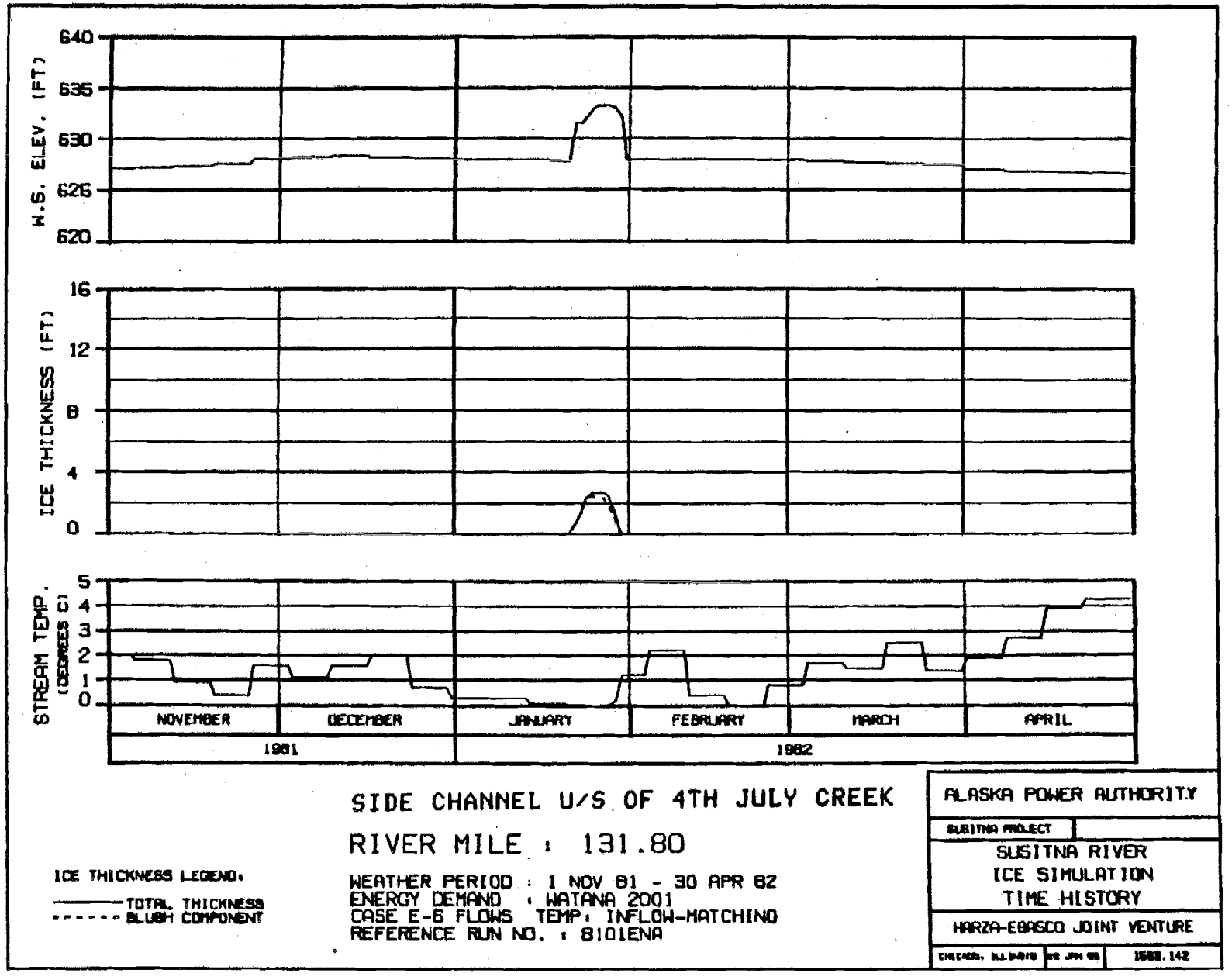
ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 810ENA

ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER ICE SIMULATION TIME HISTORY
HARZA-EBASCO JOINT VENTURE
CHICAGO, ILLINOIS — JAN 88 — 1568.142



SIDE CHANNEL U/S OF 4TH JULY CREEK

RIVER MILE : 131.80

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

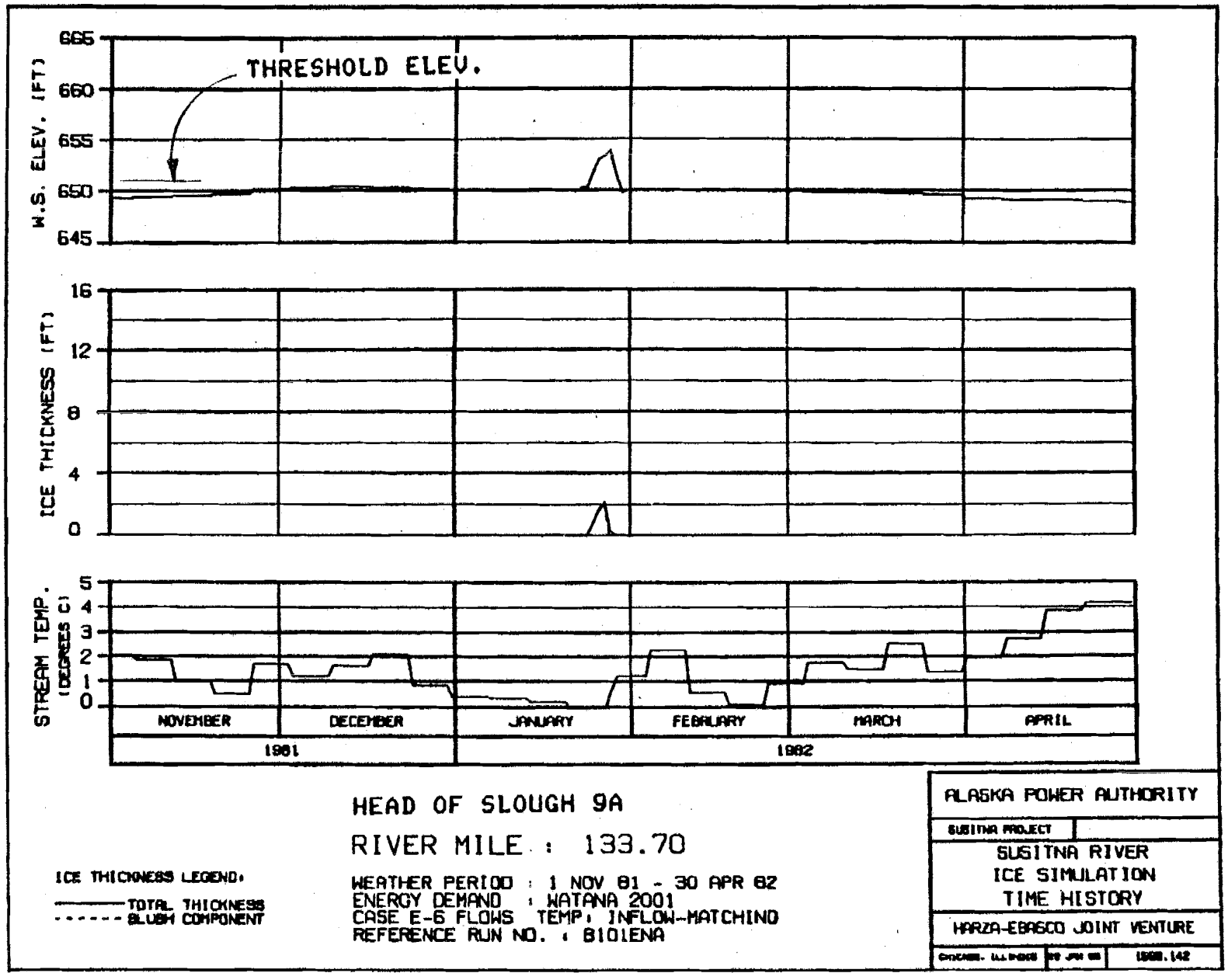
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1588.142



HEAD OF SLOUGH 9A

RIVER MILE : 133.70

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : B101ENA

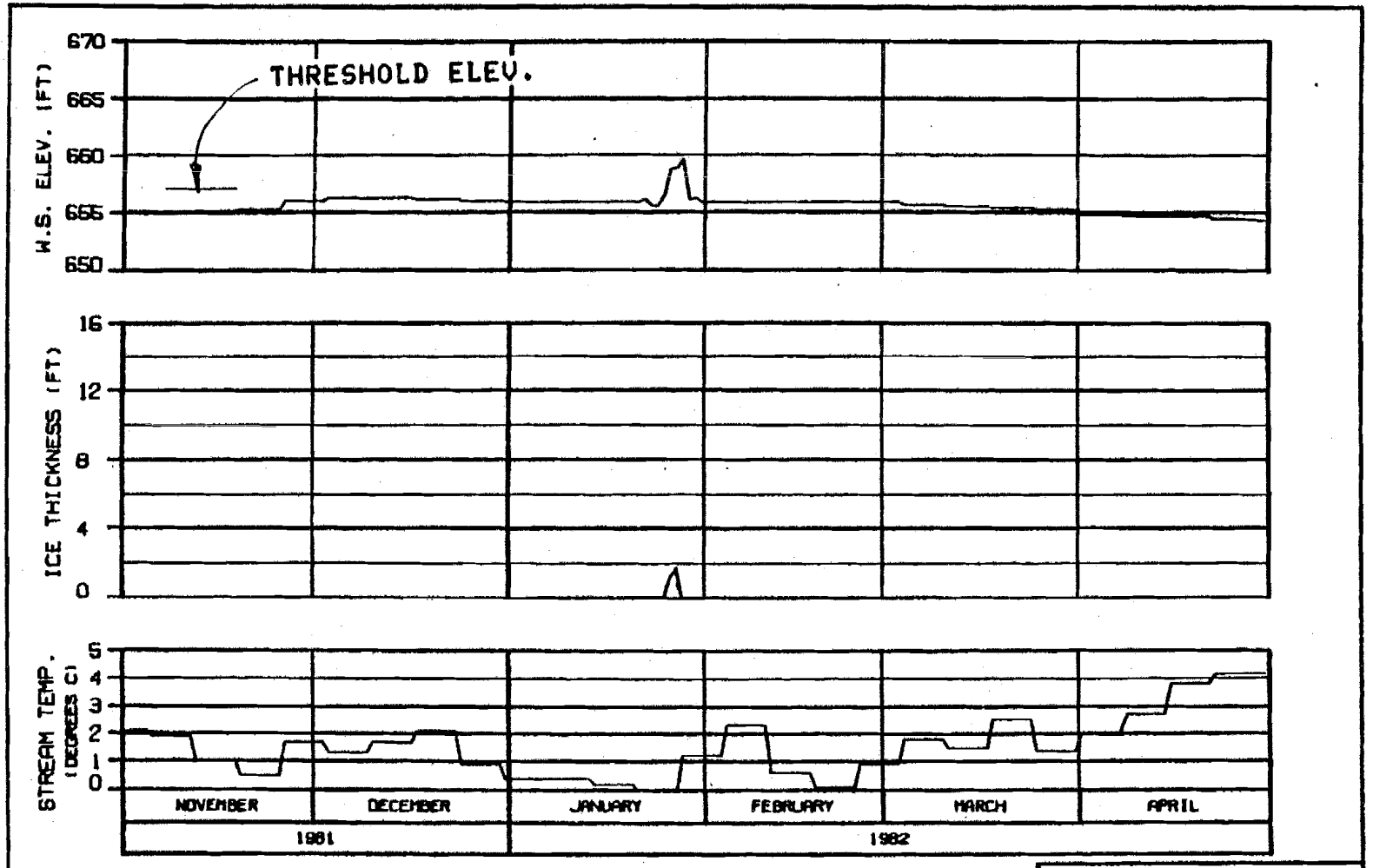
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 29 JAN 88 | 1988.142



SIDE CHANNEL U/S OF SLOUGH 10

RIVER MILE : 134.30

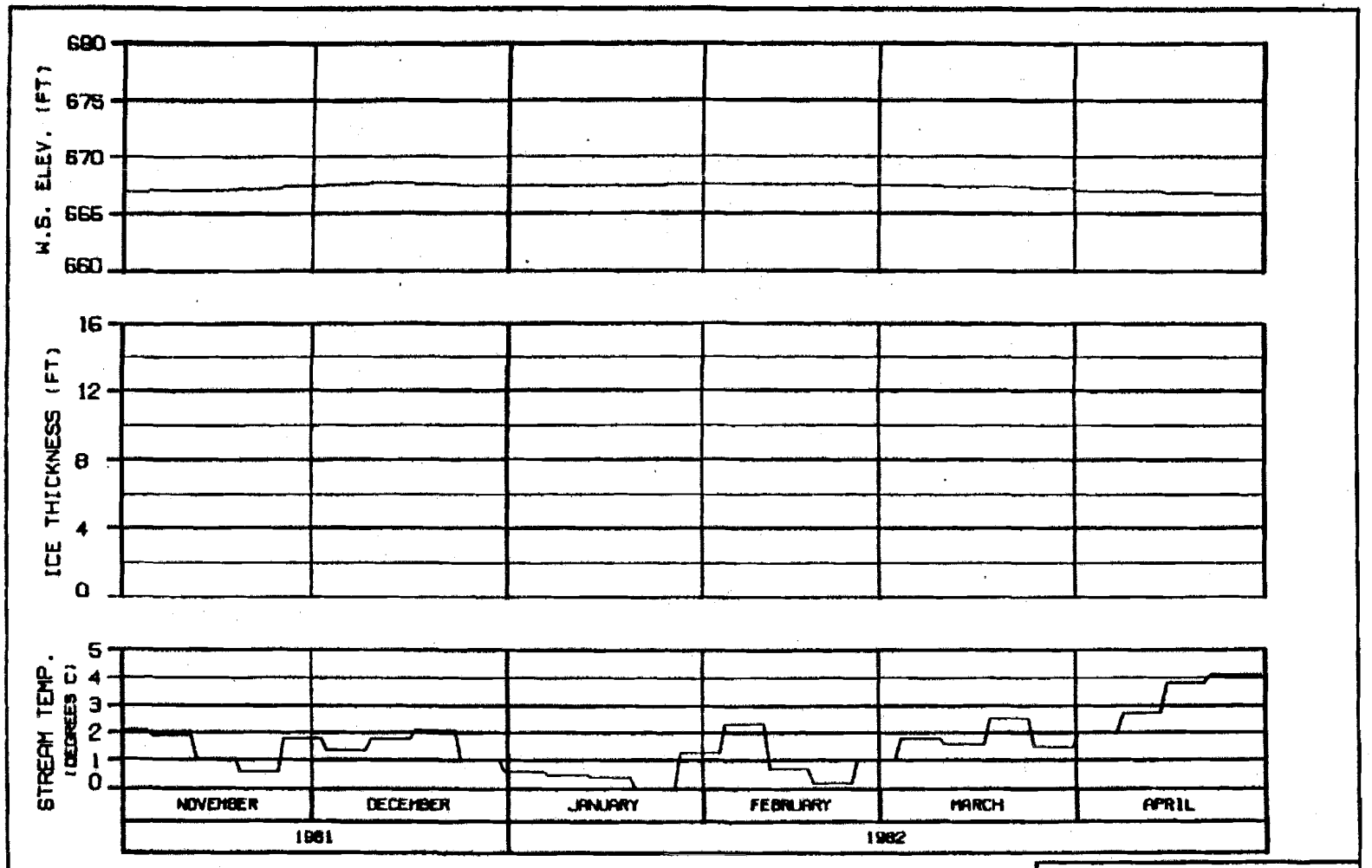
ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

ALASKA POWER AUTHORITY	
SUSITNA PROJECT	
SUSITNA RIVER ICE SIMULATION TIME HISTORY	
HARZA-EBASCO JOINT VENTURE	
CHICAGO, ILLINOIS	1588.142



SIDE CHANNEL D/S OF SLOUGH 11

RIVER MILE : 135.30

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 810IENA

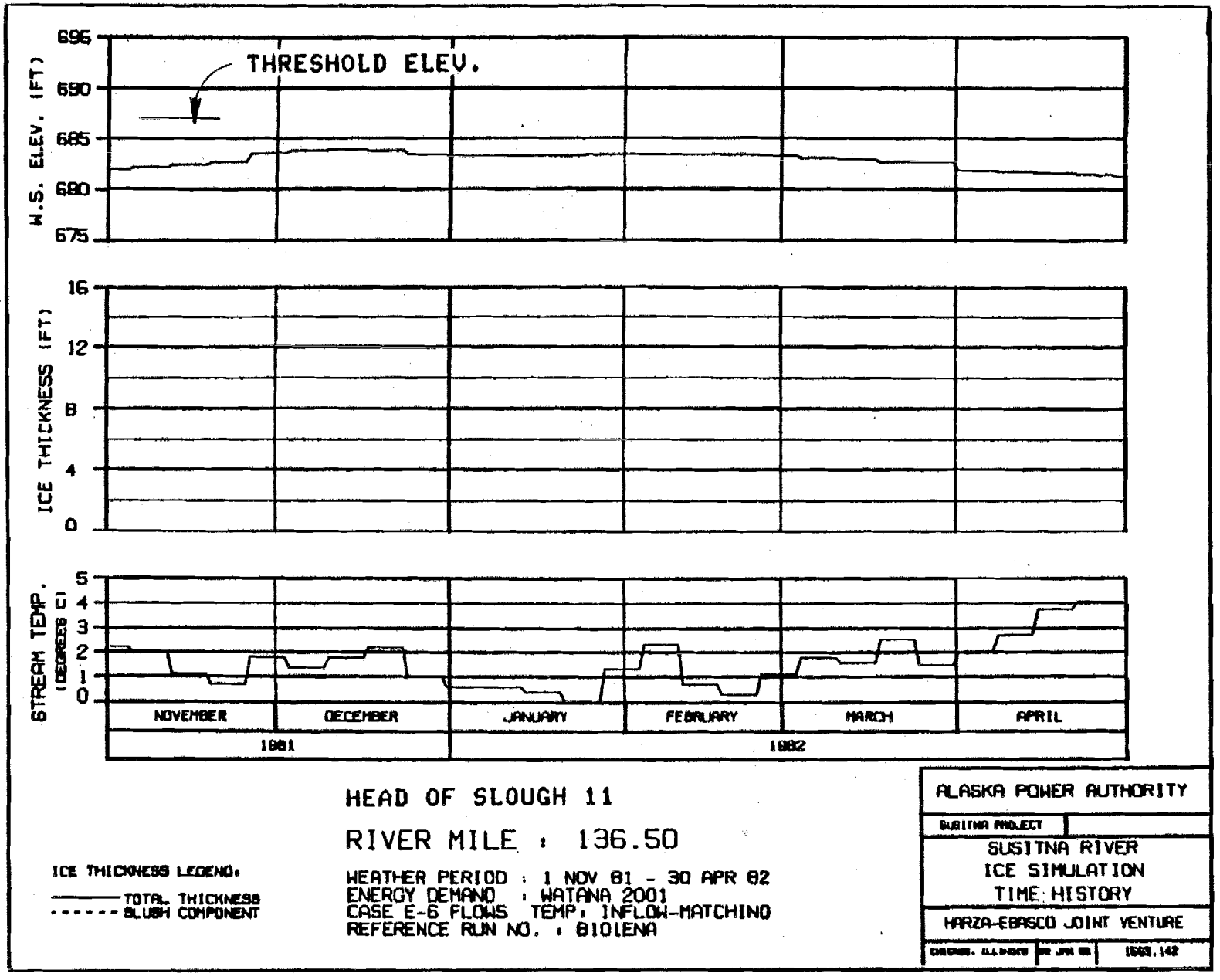
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 30 JAN 85 | 1580.142



HEAD OF SLOUGH 11

RIVER MILE : 136.50

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP. INFLOW-MATCHING
REFERENCE RUN NO. : 810LENA

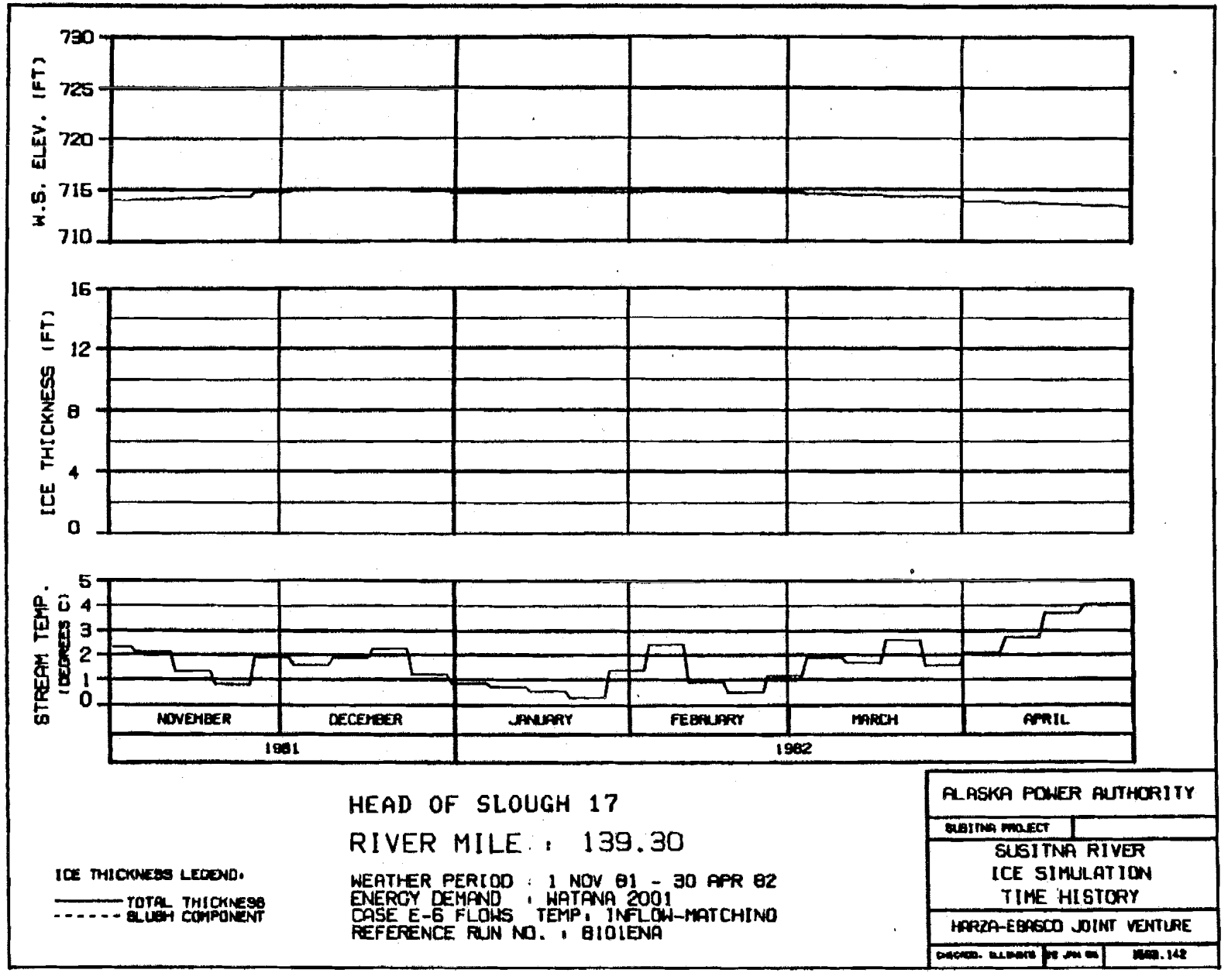
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1683.142



HEAD OF SLOUGH 17

RIVER MILE : 139.30

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81013NA

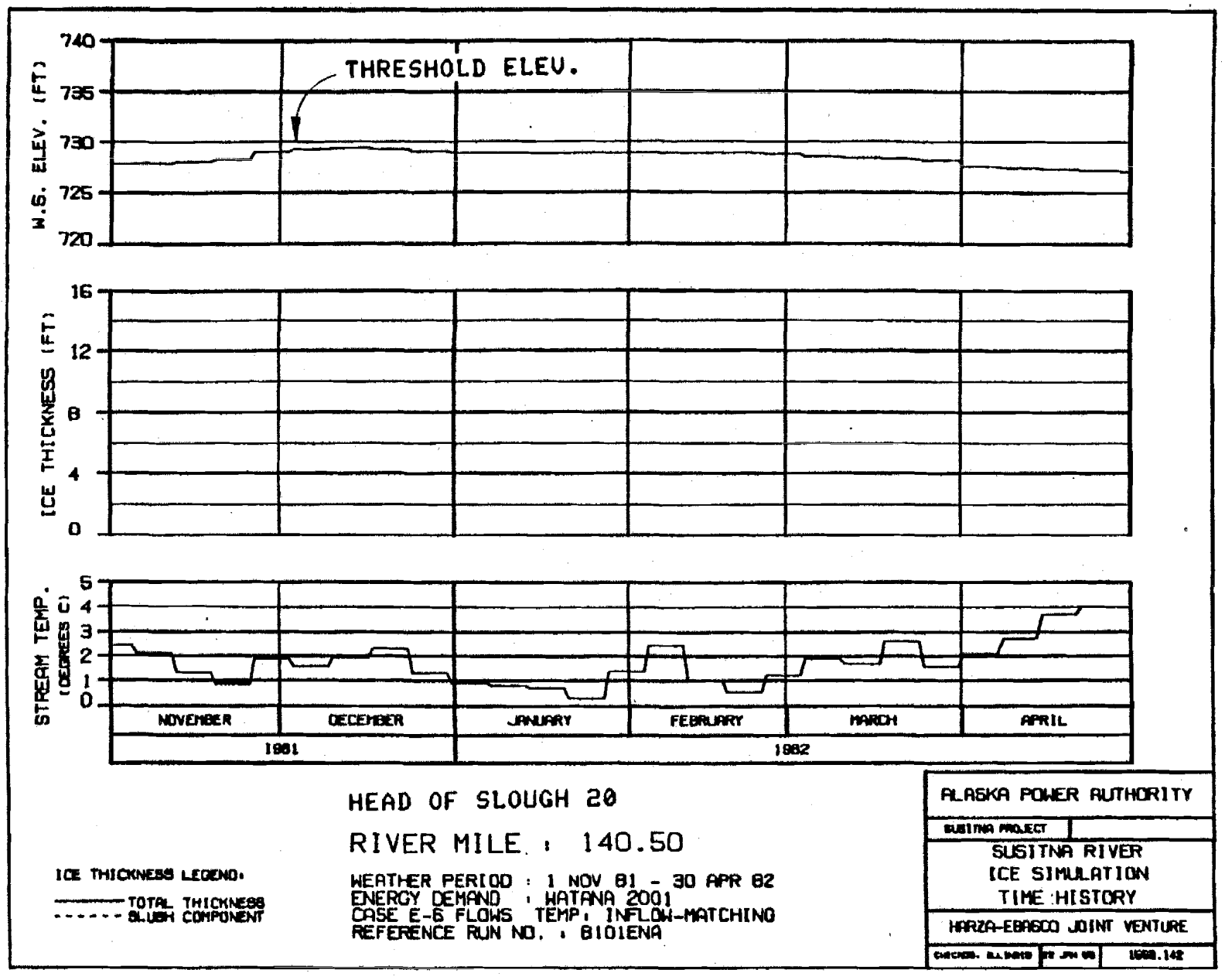
ALASKA POWER AUTHORITY

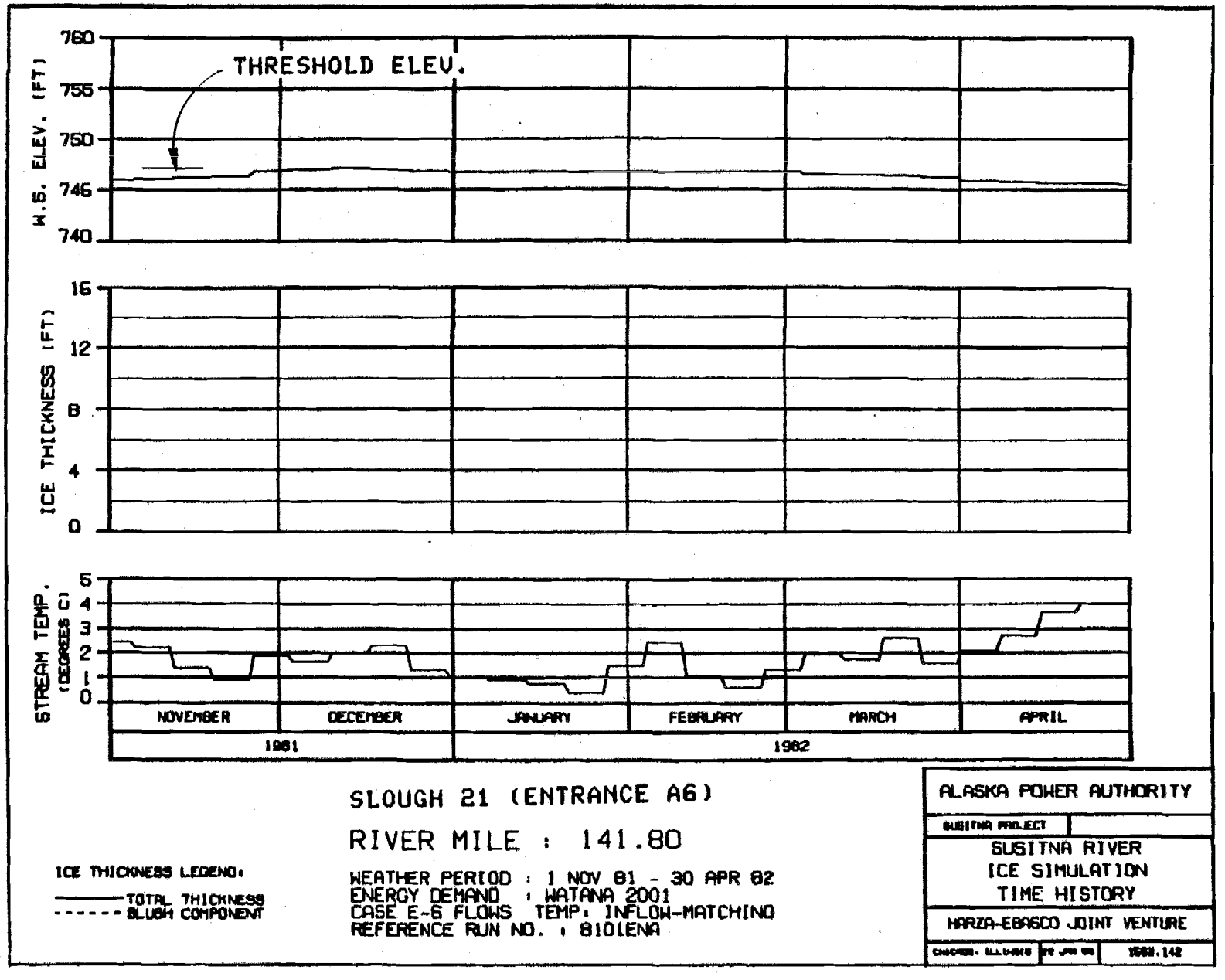
SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

DRAWING NO. 142


W.S. ELEV. (FT)
740
735
730
725
720
THRESHOLD ELEV.
ICE THICKNESS (FT)
16
12
8
4
0
STREAM TEMP. (DEGREES C)
5
4
3
2
1
0
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
1981
1982
HEAD OF SLOUGH 20
RIVER MILE : 140.50
ICE THICKNESS LEGEND:
TOTAL THICKNESS
SLUSH COMPONENT
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : B101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE



SLOUGH 21 (ENTRANCE A6)

RIVER MILE : 141.80

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA

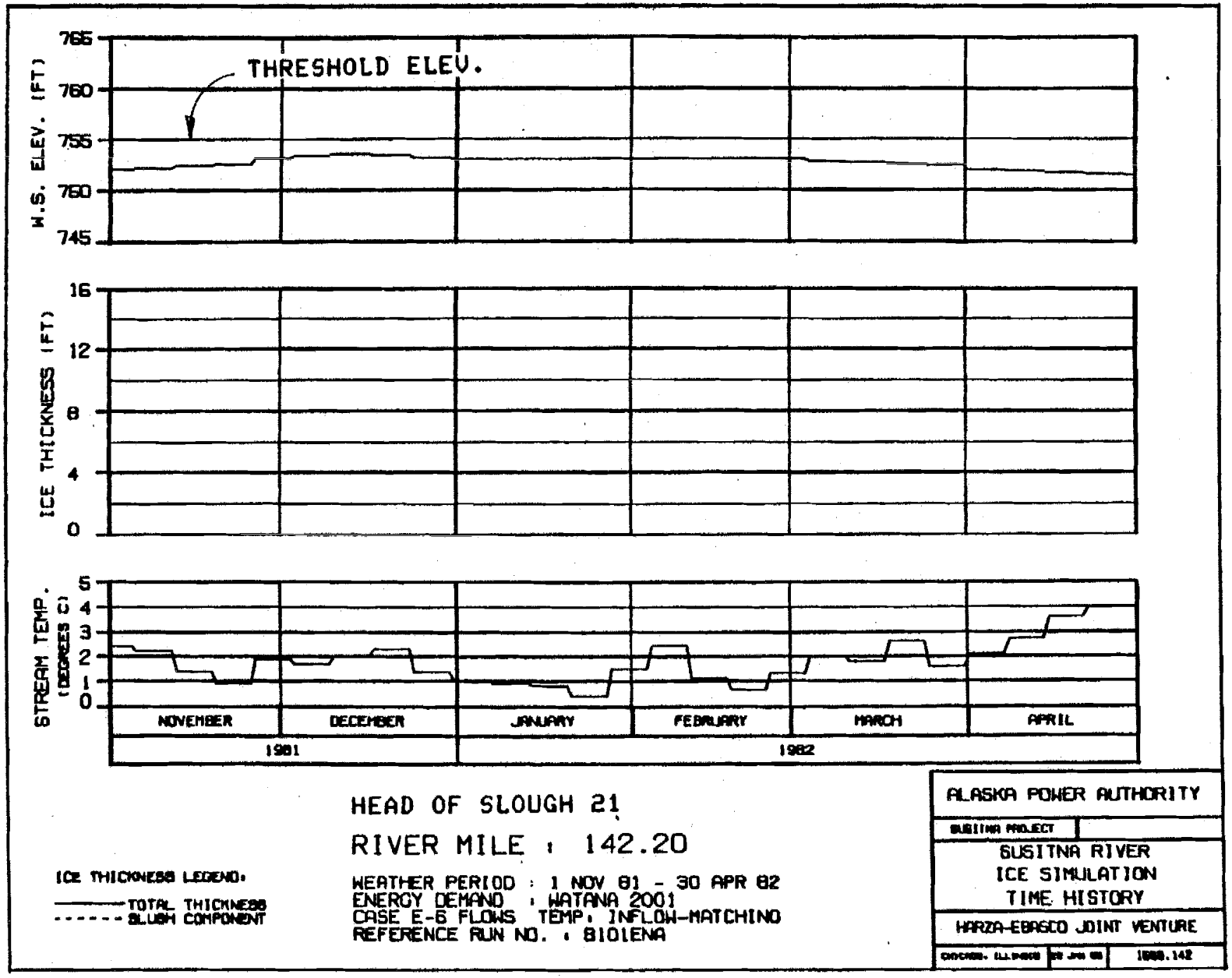
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHECKED: [illegible] 19 JAN 88 15681.142



HEAD OF SLOUGH 21

RIVER MILE : 142.20

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 810IENA

ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1988.142

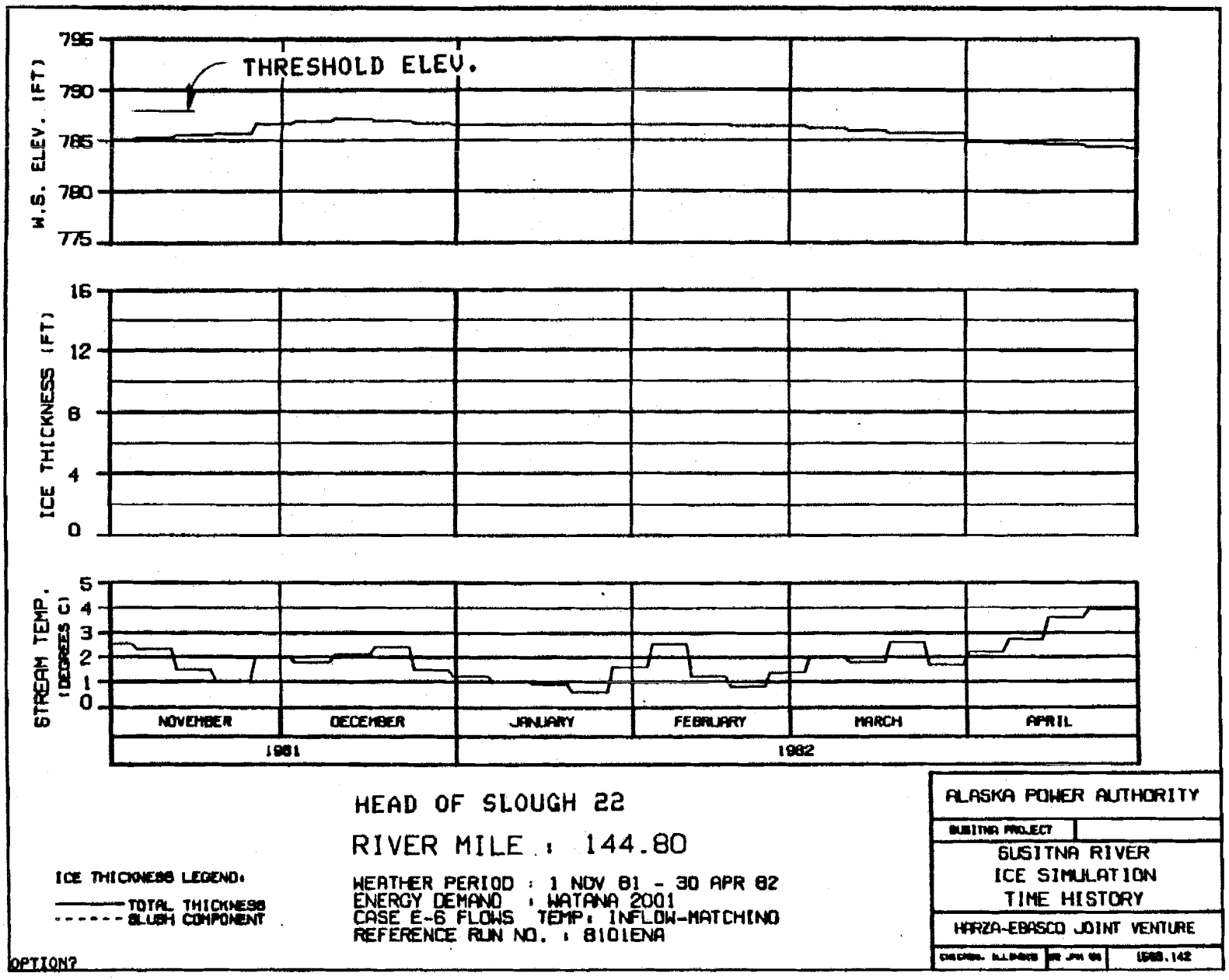

C
W.S. ELEV. (FT)
795
790
785
780
775
THRESHOLD ELEV.
ICE THICKNESS (FT)
16
12
8
4
0
STREAM TEMP. (DEGREES C)
5
4
3
2
1
0
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
1981
1982
HEAD OF SLOUGH 22
RIVER MILE : 144.80
ICE THICKNESS LEGEND:
TOTAL THICKNESS
SLUSH COMPONENT
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE E-6 FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE
OPTION?

Exhibit G-7

CASE C RIVER ICE SIMULATIONS

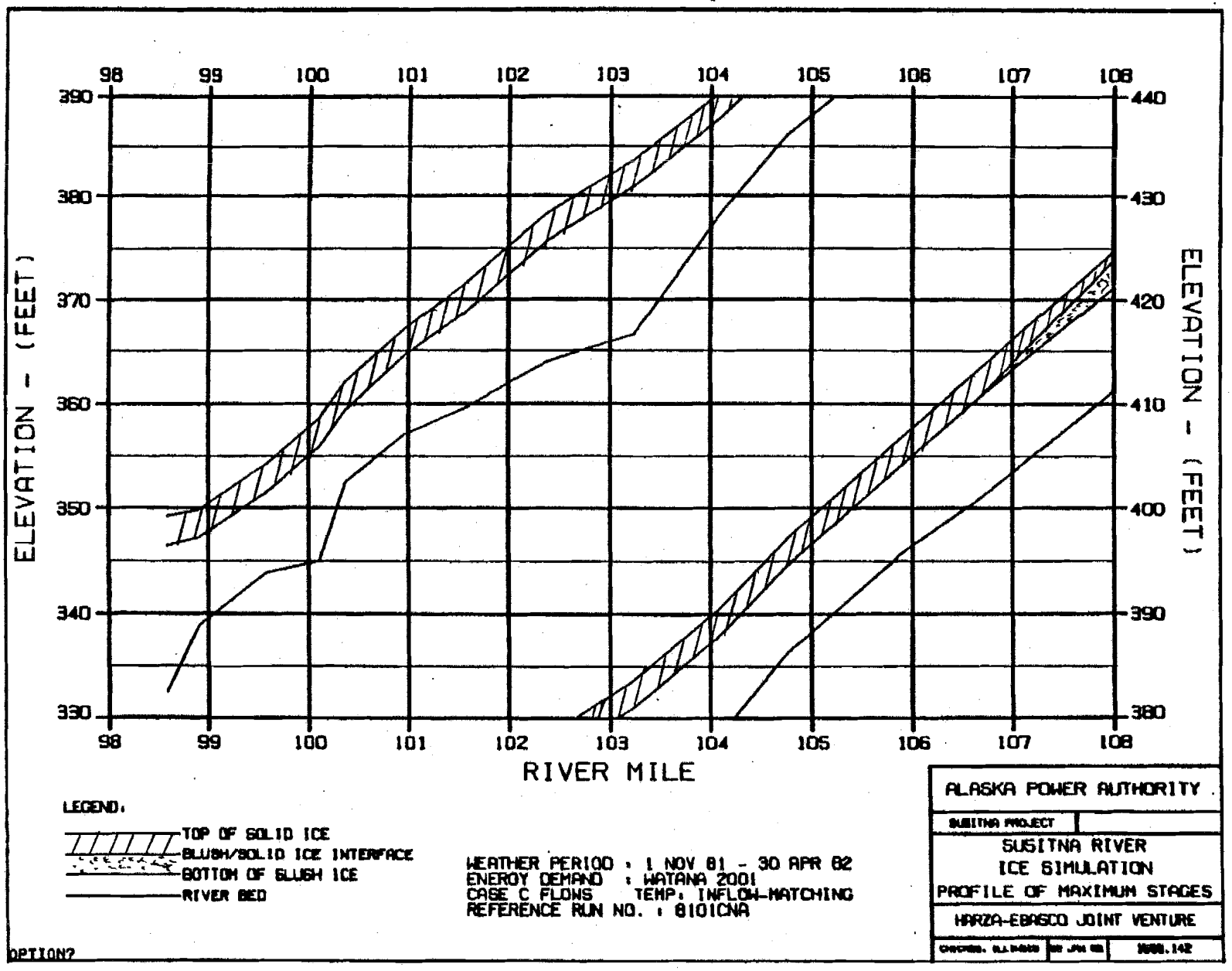
FOR

PROJECTED ENERGY DEMANDS - YEAR 2001

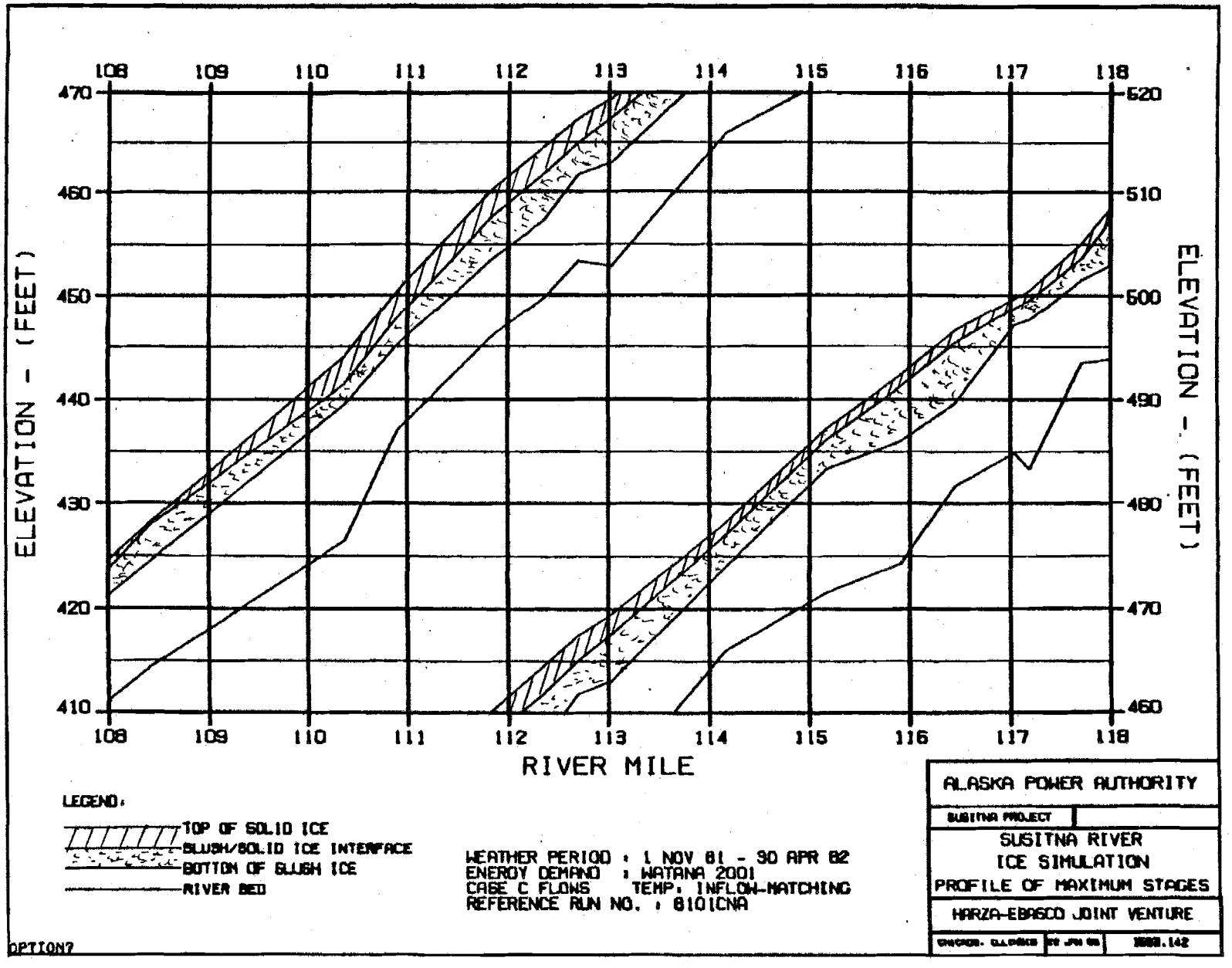
- o Profiles of Maximum Stages (5 sheets)
- o Progression of Ice Front and Zero Degree Isotherm (1)
- o Time History (22 locations)

Note: Simulations are based on hydrologic and meteorologic data from the period November 1981 to May 1982.

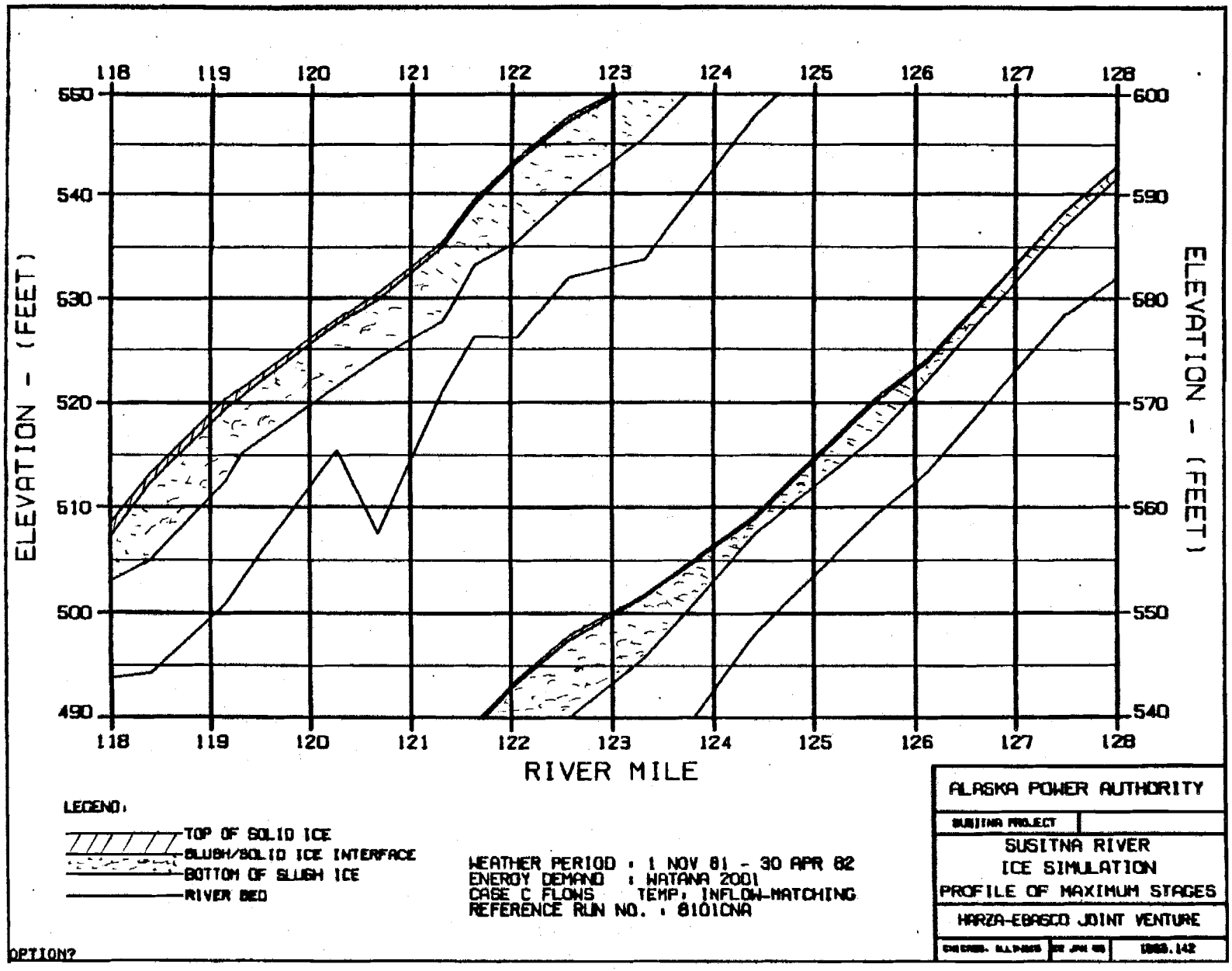
C


98
99
100
101
102
103
104
105
106
107
108
390
380
370
360
350
340
330
440
430
420
410
400
390
380
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
OPTION2

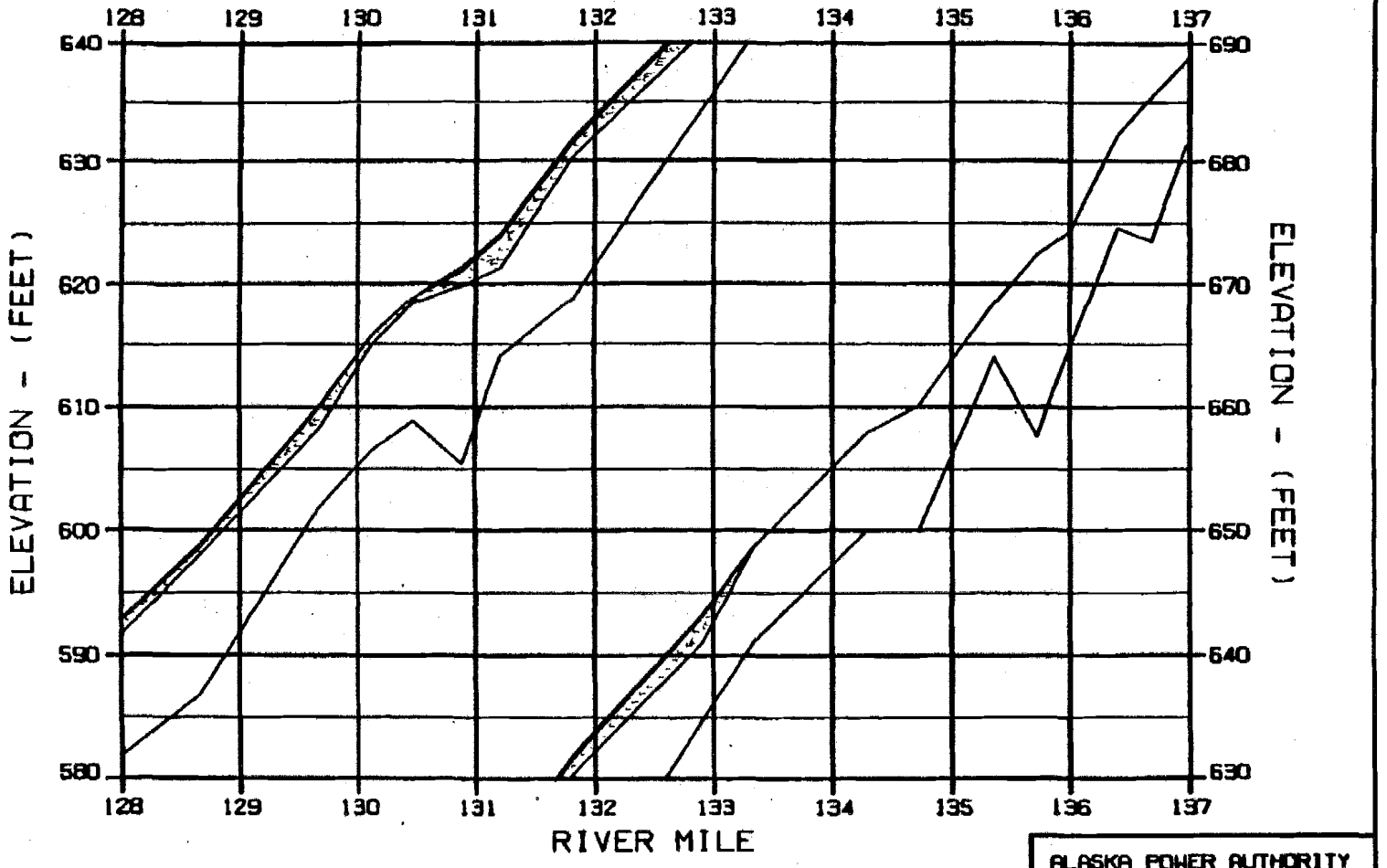
C


108
109
110
111
112
113
114
115
116
117
118
470
460
450
440
430
420
410
520
510
500
490
480
470
460
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
1588.142
OPTION7

C


118
119
120
121
122
123
124
125
126
127
128
550
540
530
520
510
500
490
600
590
580
570
560
550
540
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE
1988.142
OPTION?

C



LEGEND:

TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

ALASKA POWER AUTHORITY

SUSITNA PROJECT

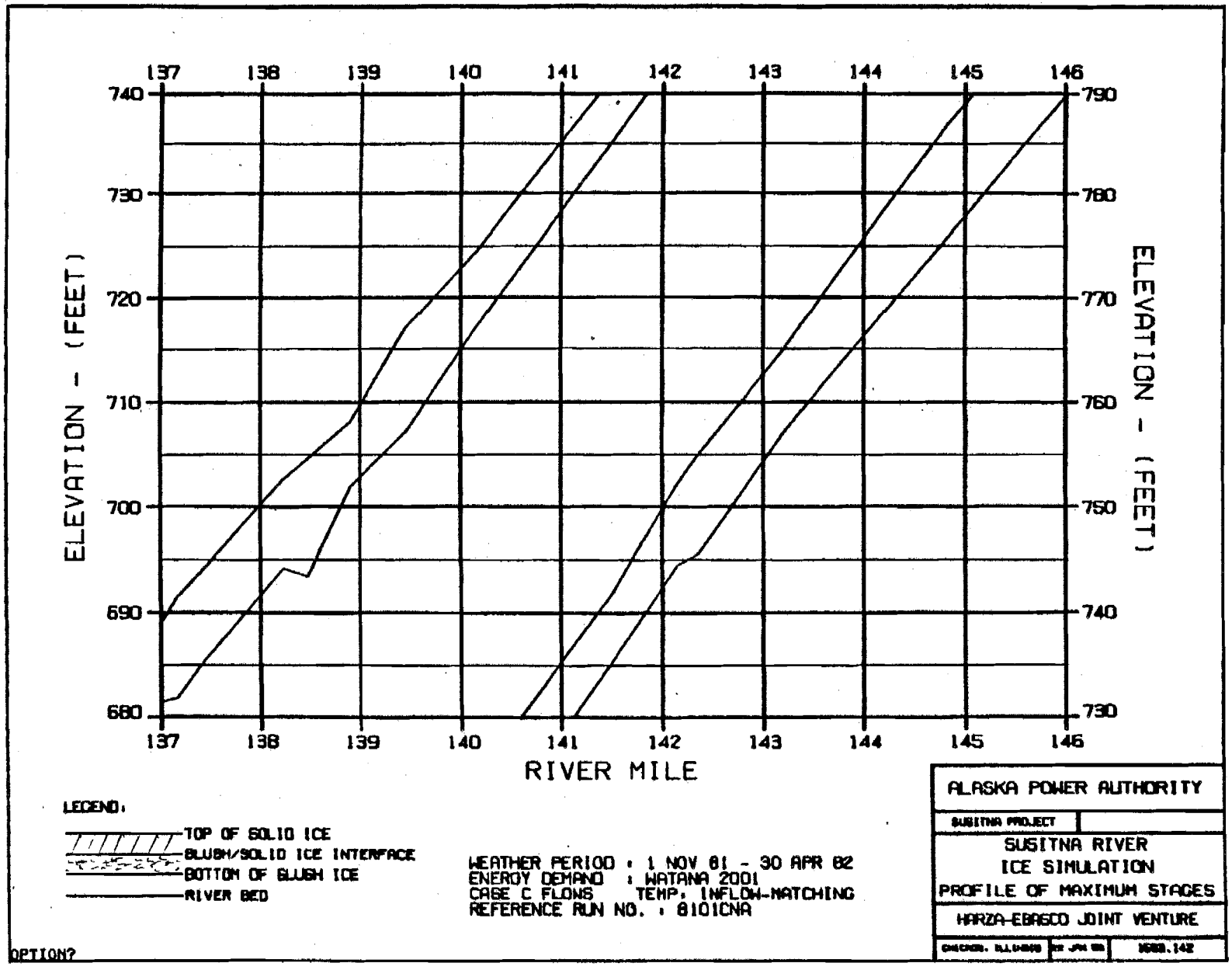
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | DR JAN 88 | 1880.142

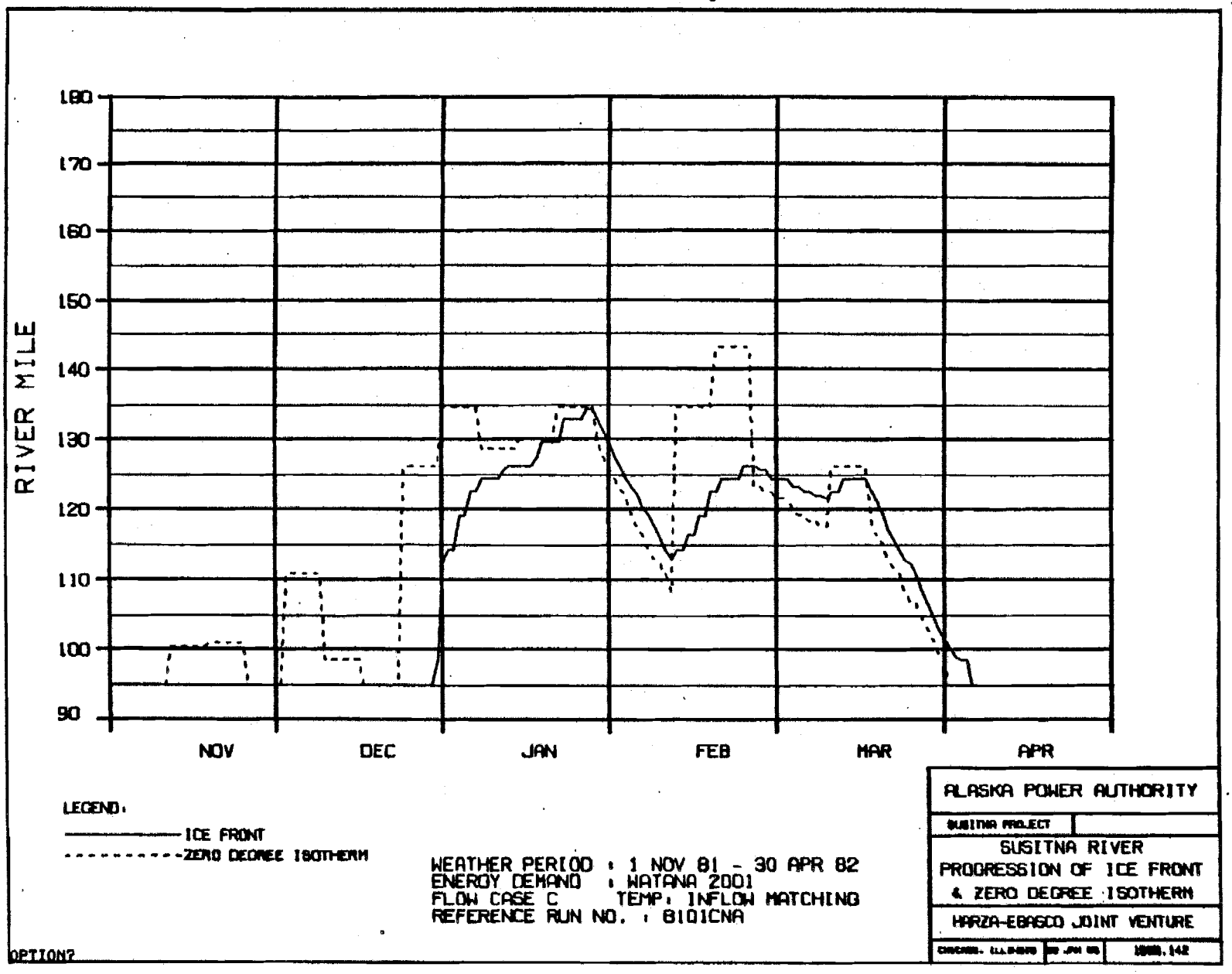
OPTION?

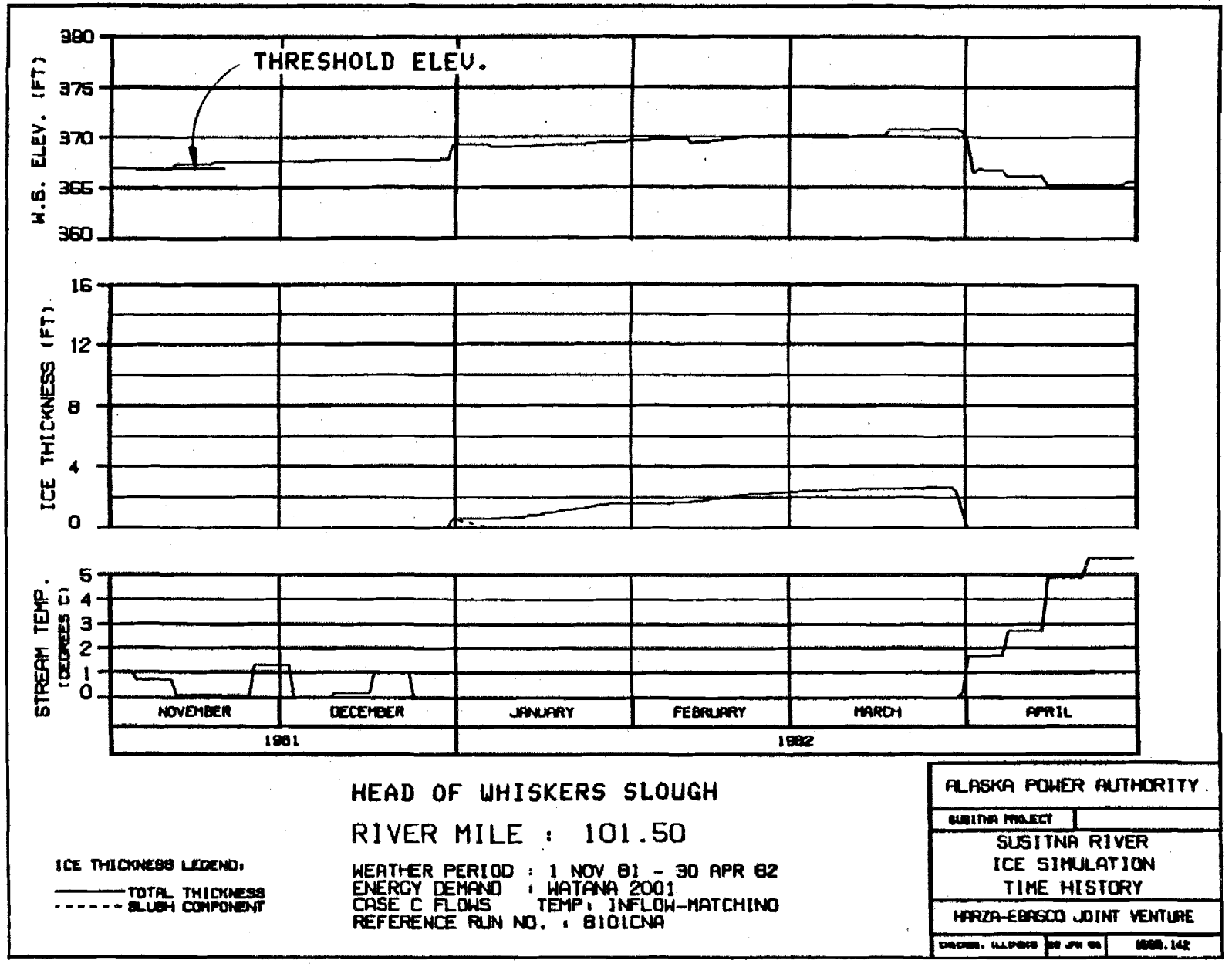
C


137
138
139
140
141
142
143
144
145
146
740
730
720
710
700
690
680
790
780
770
760
750
740
730
ELEVATION - (FEET)
ELEVATION - (FEET)
RIVER MILE
LEGEND:
TOP OF SOLID ICE
SLUSH/SOLID ICE INTERFACE
BOTTOM OF SLUSH ICE
RIVER BED
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
PROFILE OF MAXIMUM STAGES
HARZA-EBASCO JOINT VENTURE

OPTION?

C


RIVER MILE
180
170
160
150
140
130
120
110
100
90
NOV
DEC
JAN
FEB
MAR
APR
LEGEND:
ICE FRONT
ZERO DEGREE ISOTHERM
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
FLOW CASE C TEMP: INFLOW MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
PROGRESSION OF ICE FRONT
& ZERO DEGREE ISOTHERM
HARZA-EBASCO JOINT VENTURE
OPTION?



HEAD OF WHISKERS SLOUGH

RIVER MILE : 101.50

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

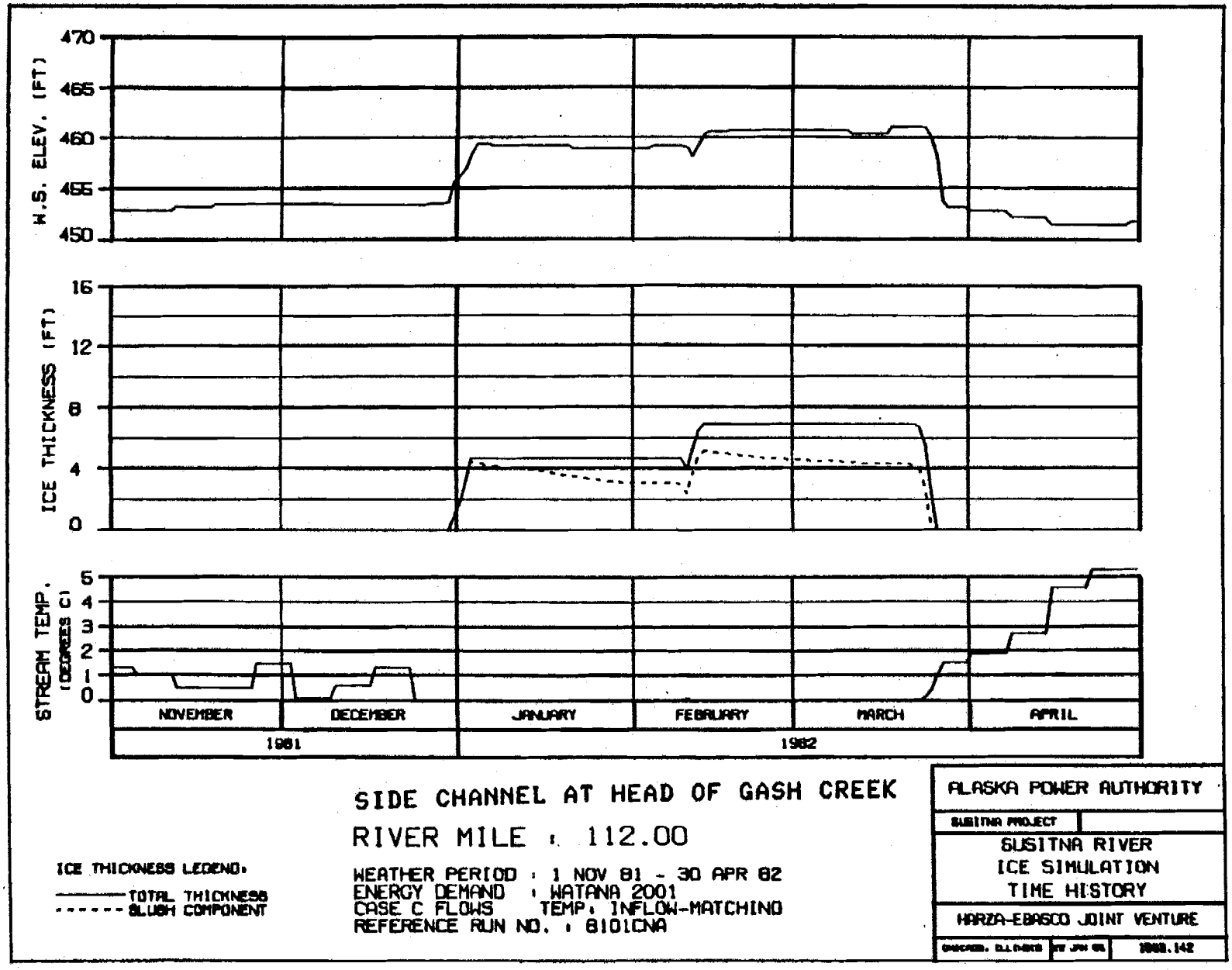
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 30 JAN 86 | 8688.142



SIDE CHANNEL AT HEAD OF GASH CREEK

RIVER MILE : 112.00

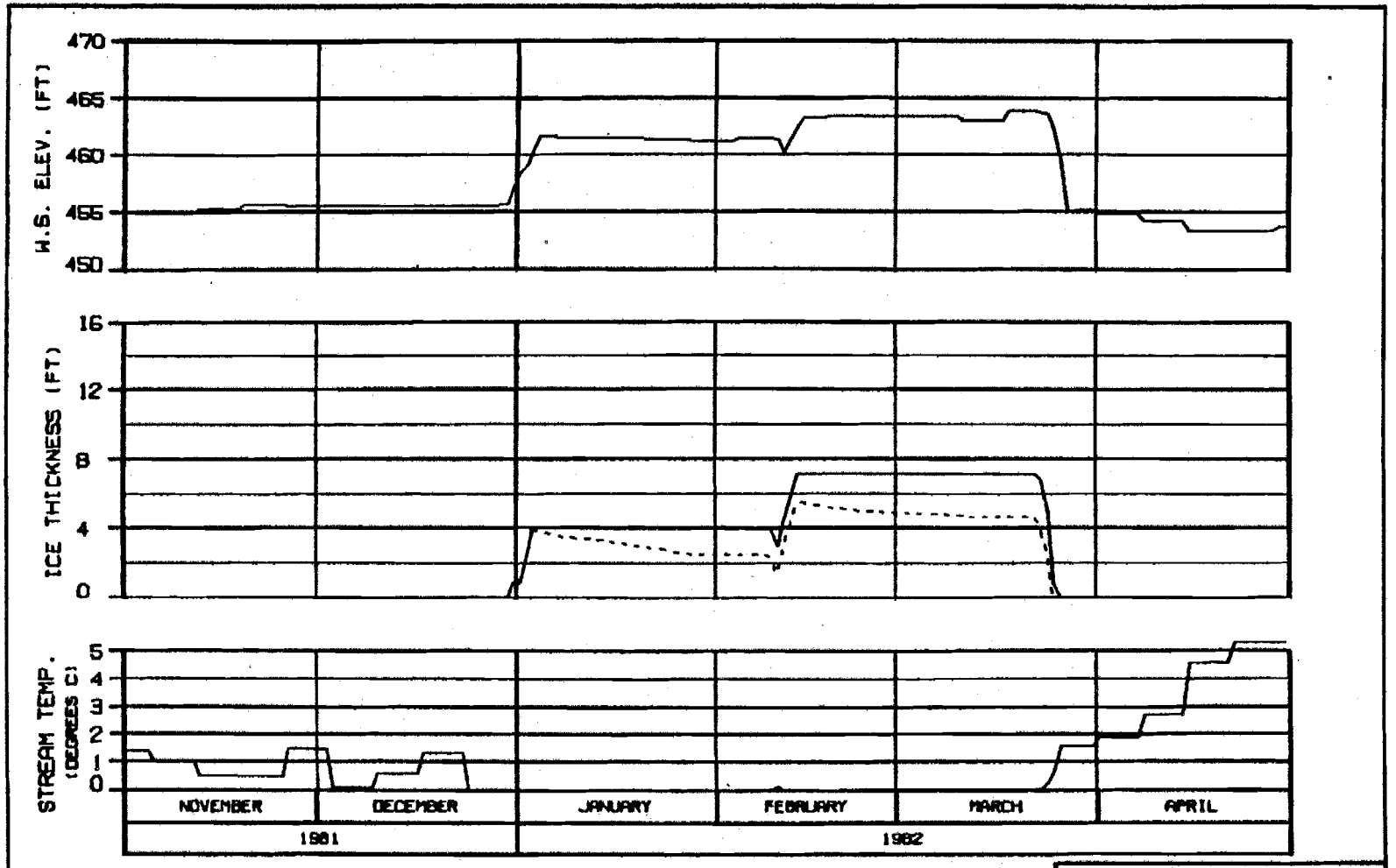
ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 810ICNA

ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER ICE SIMULATION TIME HISTORY
HARZA-EBASCO JOINT VENTURE
2668.142



MOUTH OF SLOUGH 6A

RIVER MILE : 112.34

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : B101CNA

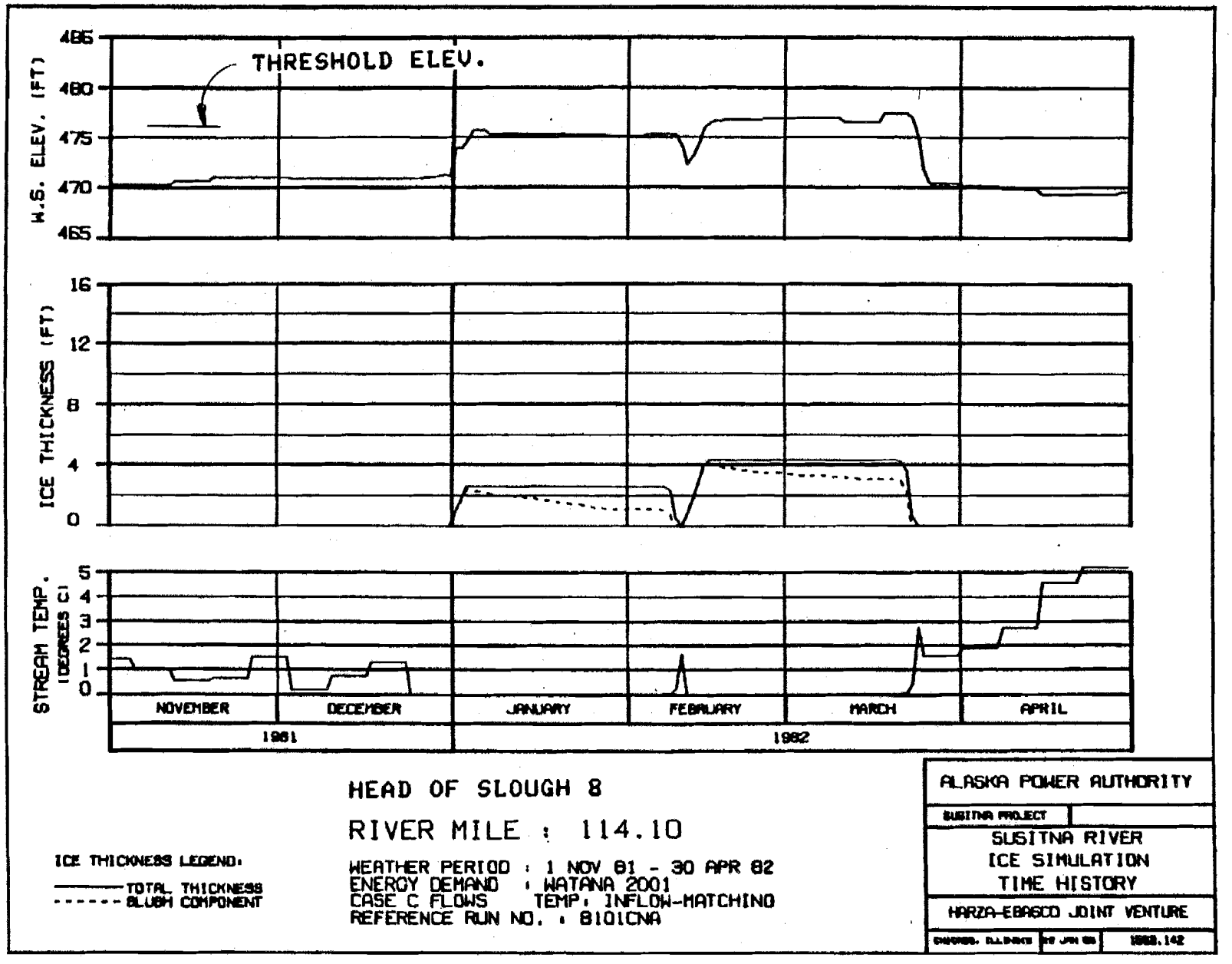
ALASKA POWER AUTHORITY

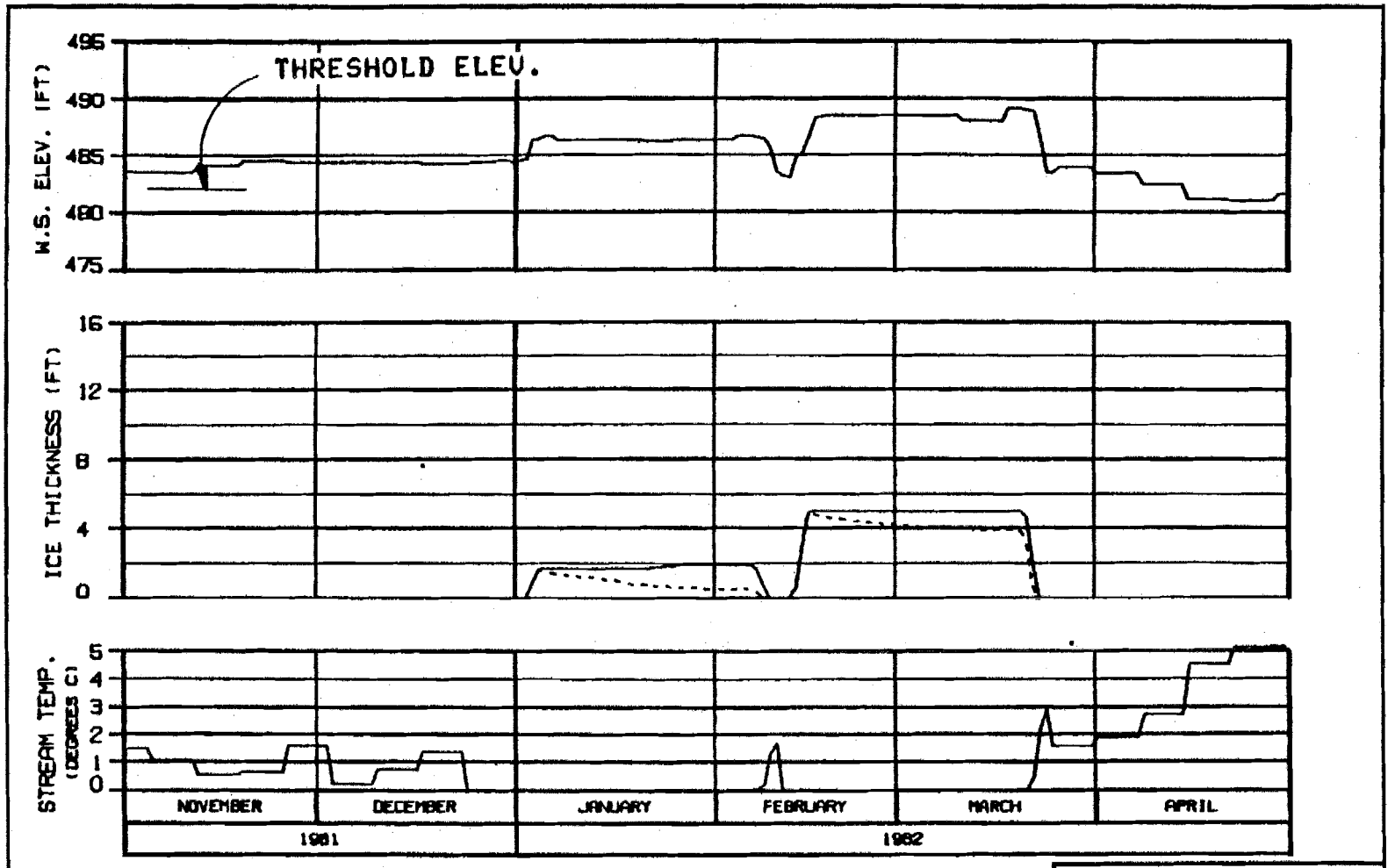
SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1688.142


W.S. ELEV. (FT)
485
480
475
470
465
THRESHOLD ELEV.
ICE THICKNESS (FT)
16
12
8
4
0
STREAM TEMP. (DEGREES C)
5
4
3
2
1
0
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
1981
1982
HEAD OF SLOUGH 8
RIVER MILE : 114.10
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ICE THICKNESS LEGEND:
TOTAL THICKNESS
SLUSH COMPONENT
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE



SIDE CHANNEL MSII

RIVER MILE : 115.50

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

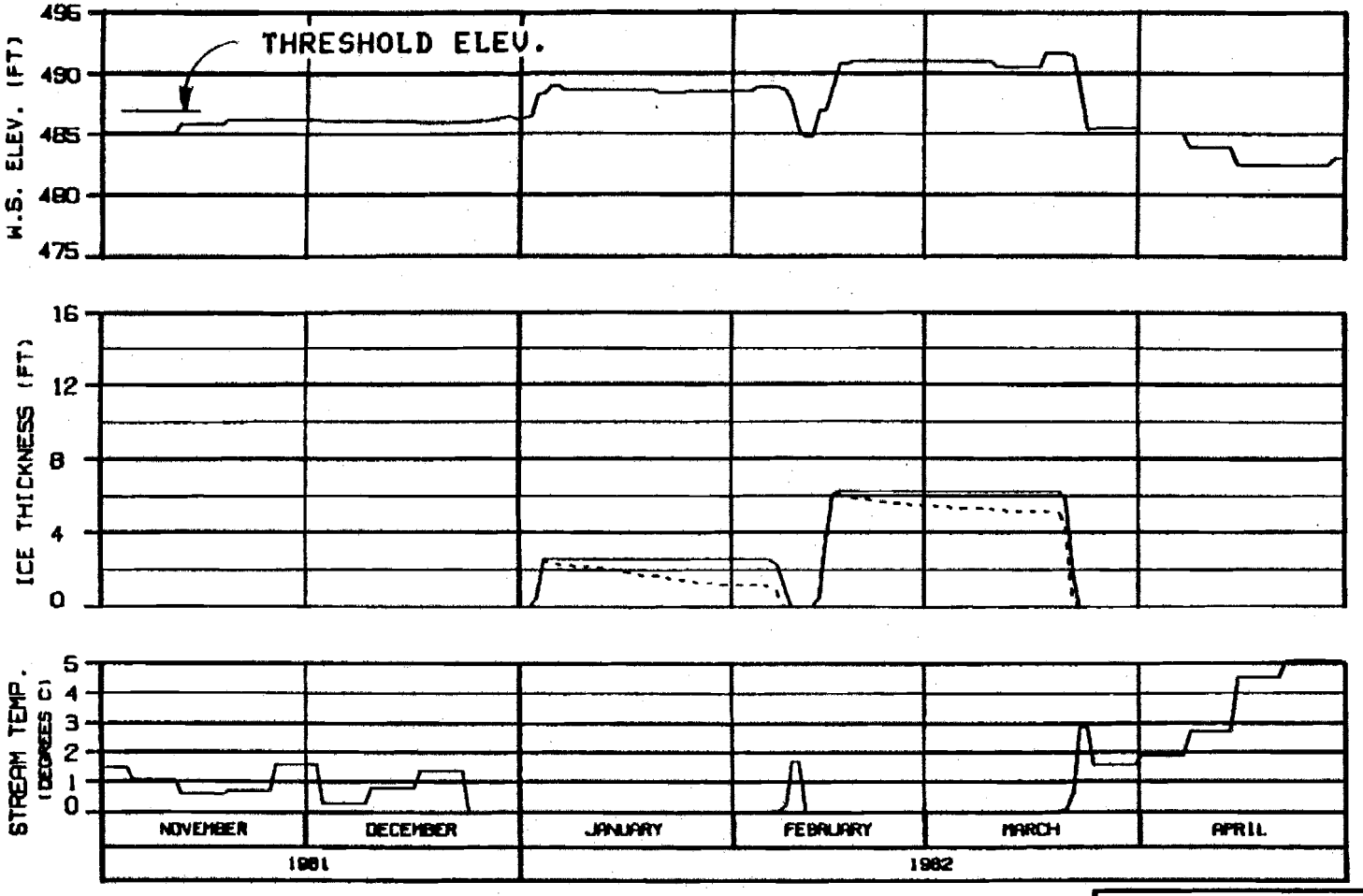
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

DWG. 1888.142



HEAD OF SIDE CHANNEL MSII

RIVER MILE : 115.90

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81D1CNA

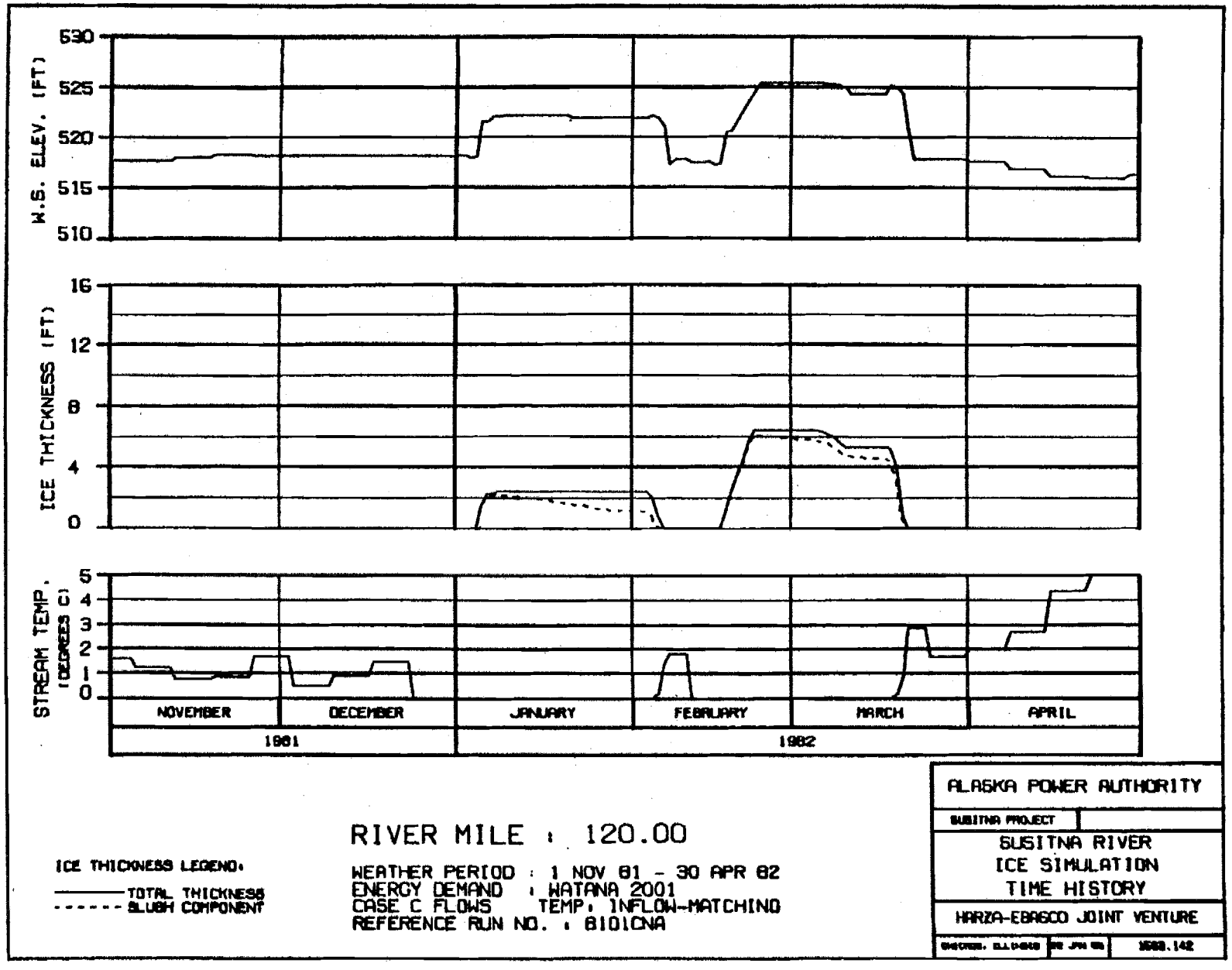
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

E888.142



RIVER MILE : 120.00

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

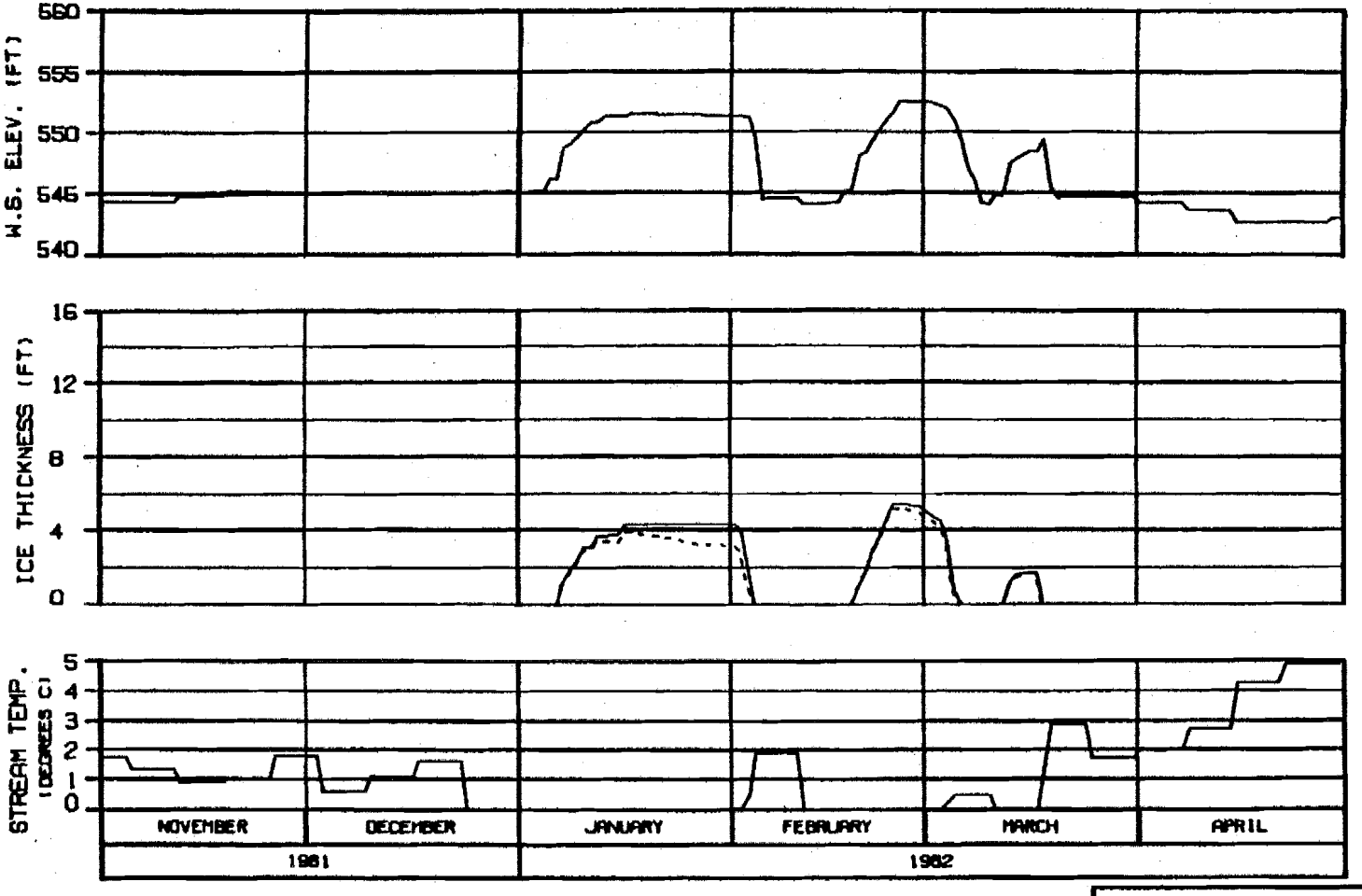
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81D1CNA

ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE



HEAD OF MOOSE SLOUGH

RIVER MILE : 123.50

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 810CNA

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS
- - - - - - SLUSH COMPONENT

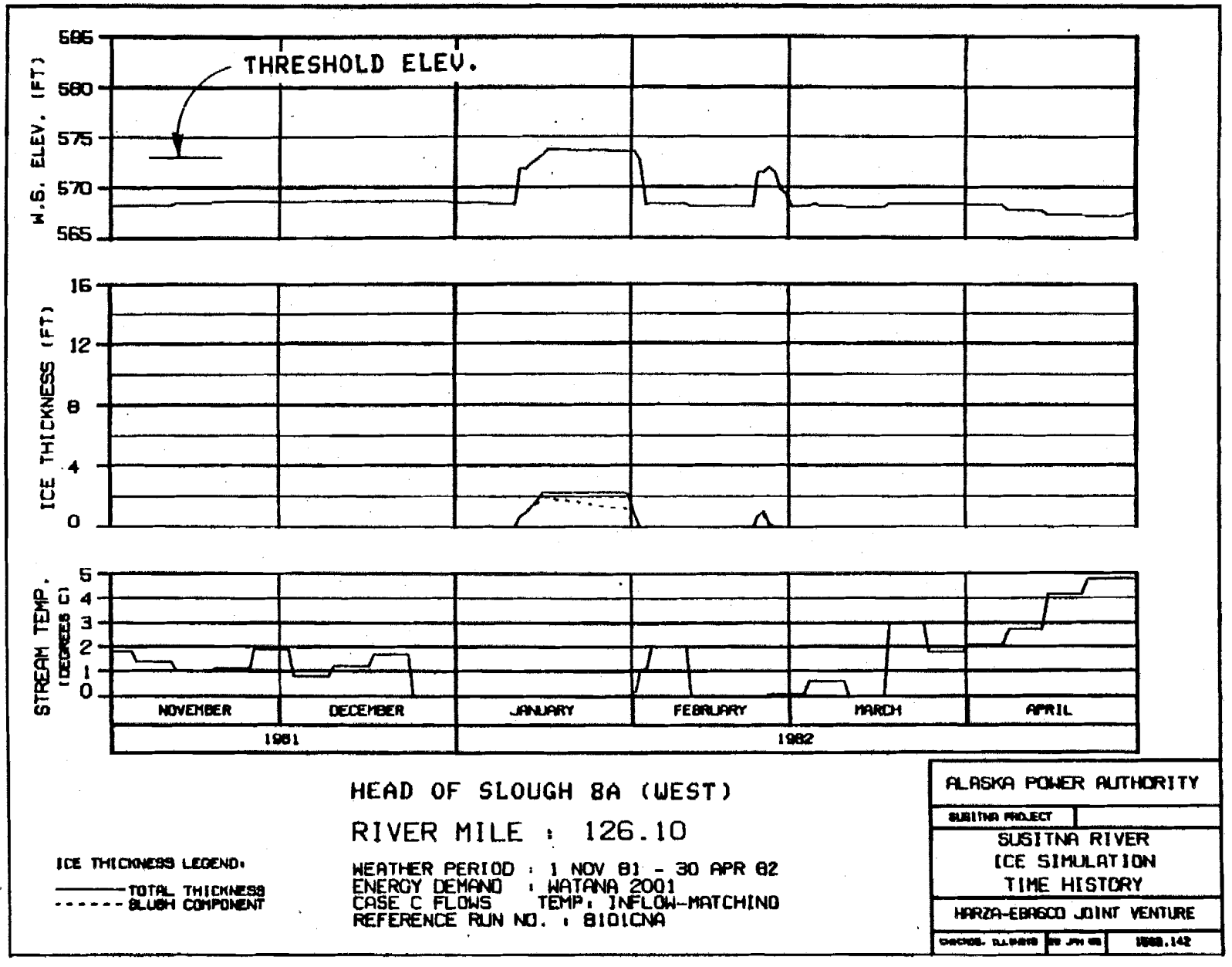
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1588.142



HEAD OF SLOUGH 8A (WEST)

RIVER MILE : 126.10

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81D1CNA

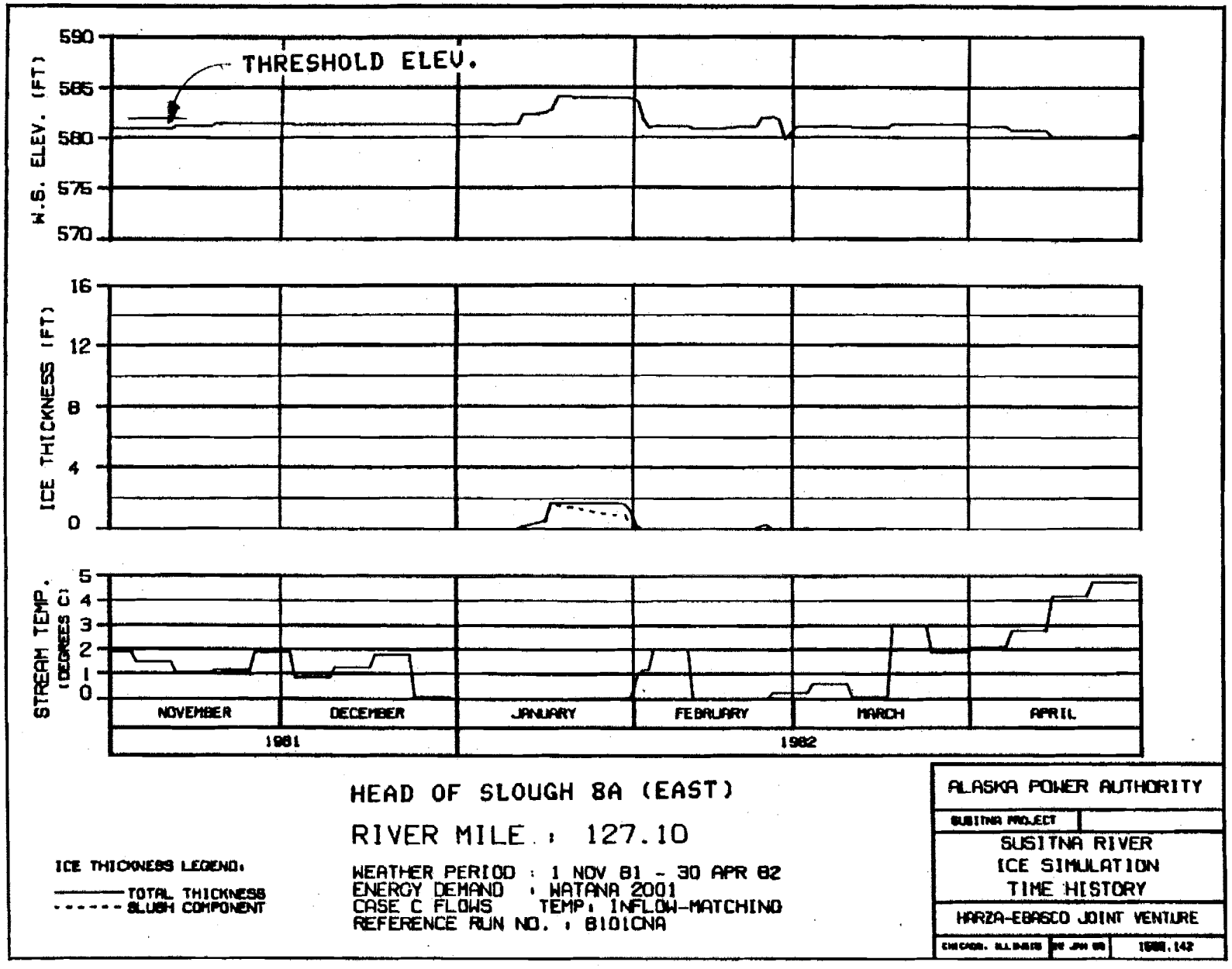
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1988.142



HEAD OF SLOUGH 8A (EAST)

RIVER MILE : 127.10

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHIND
REFERENCE RUN NO. : B101CNA

ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER ICE SIMULATION TIME HISTORY
HARZA-EBASCO JOINT VENTURE
CHICAGO, ILLINOIS — DR JAN 88 — 1588.142

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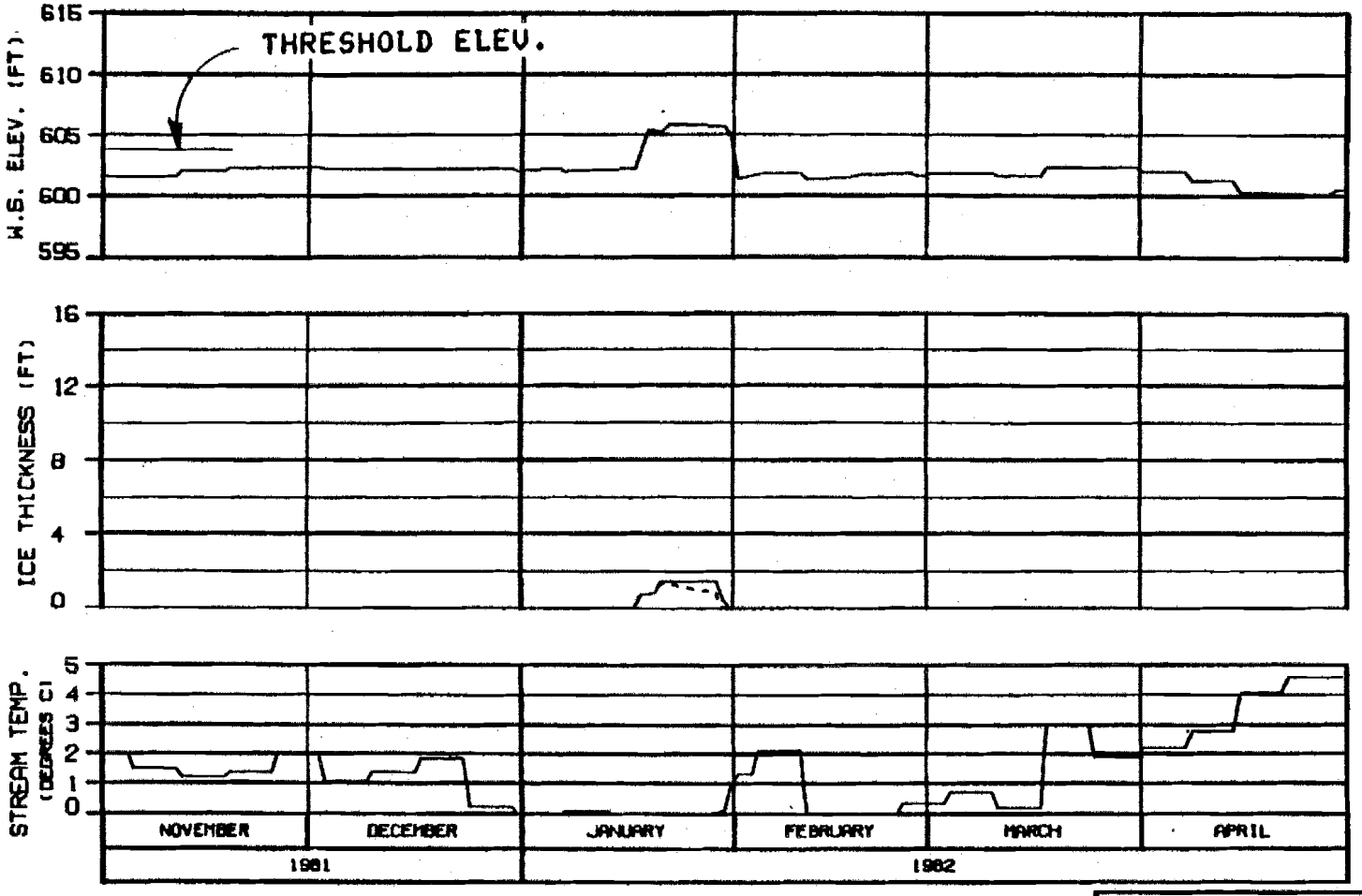


HEAD OF SLOUGH 9

RIVER MILE : 129.30

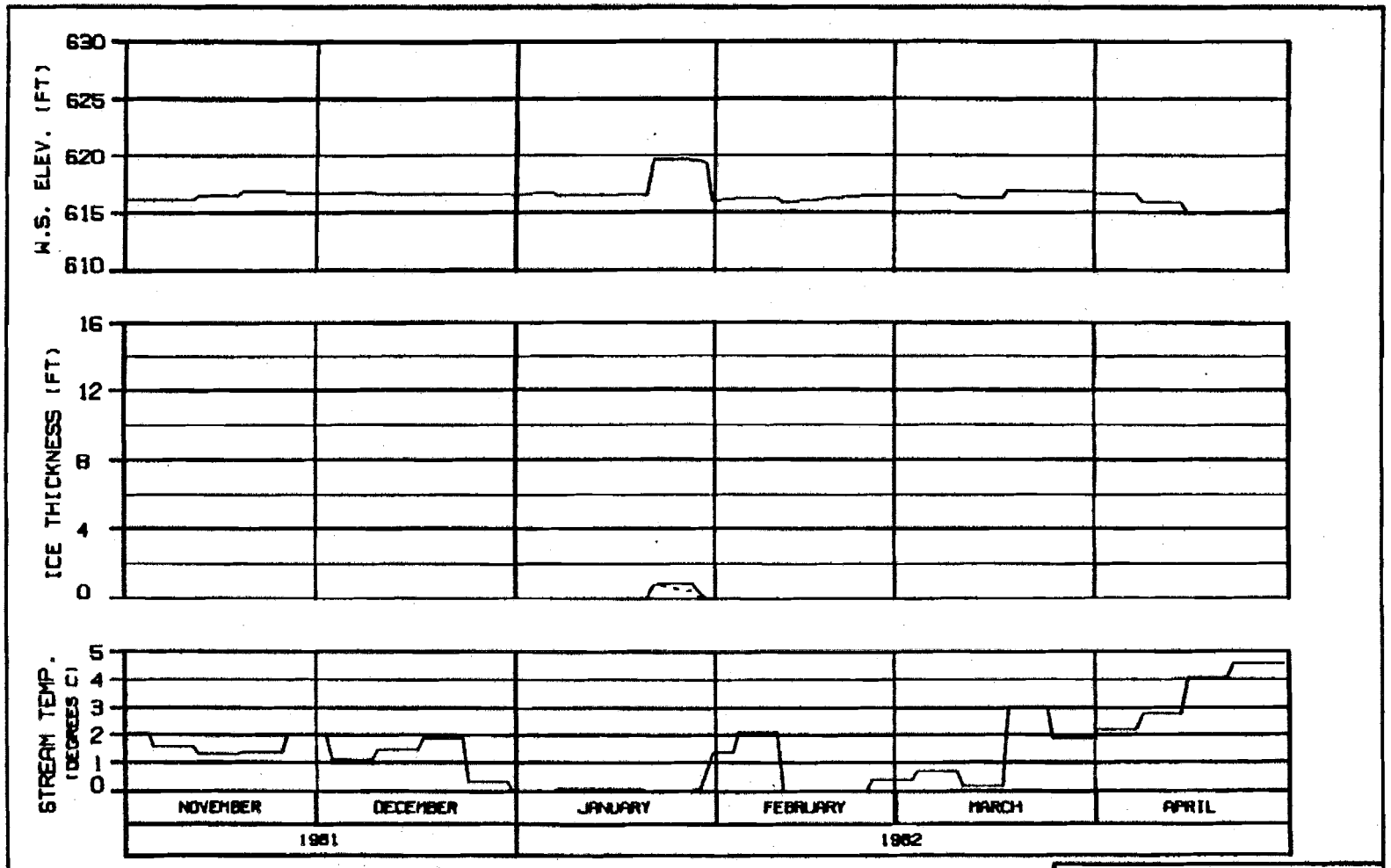
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

ICE THICKNESS LEGEND:
——— TOTAL THICKNESS
- - - - - - SLUSH COMPONENT

OPTION?

ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE

OPTION?



SIDE CHANNEL U/S OF SLOUGH 9

RIVER MILE : 130.60

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS
- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81D1CNA

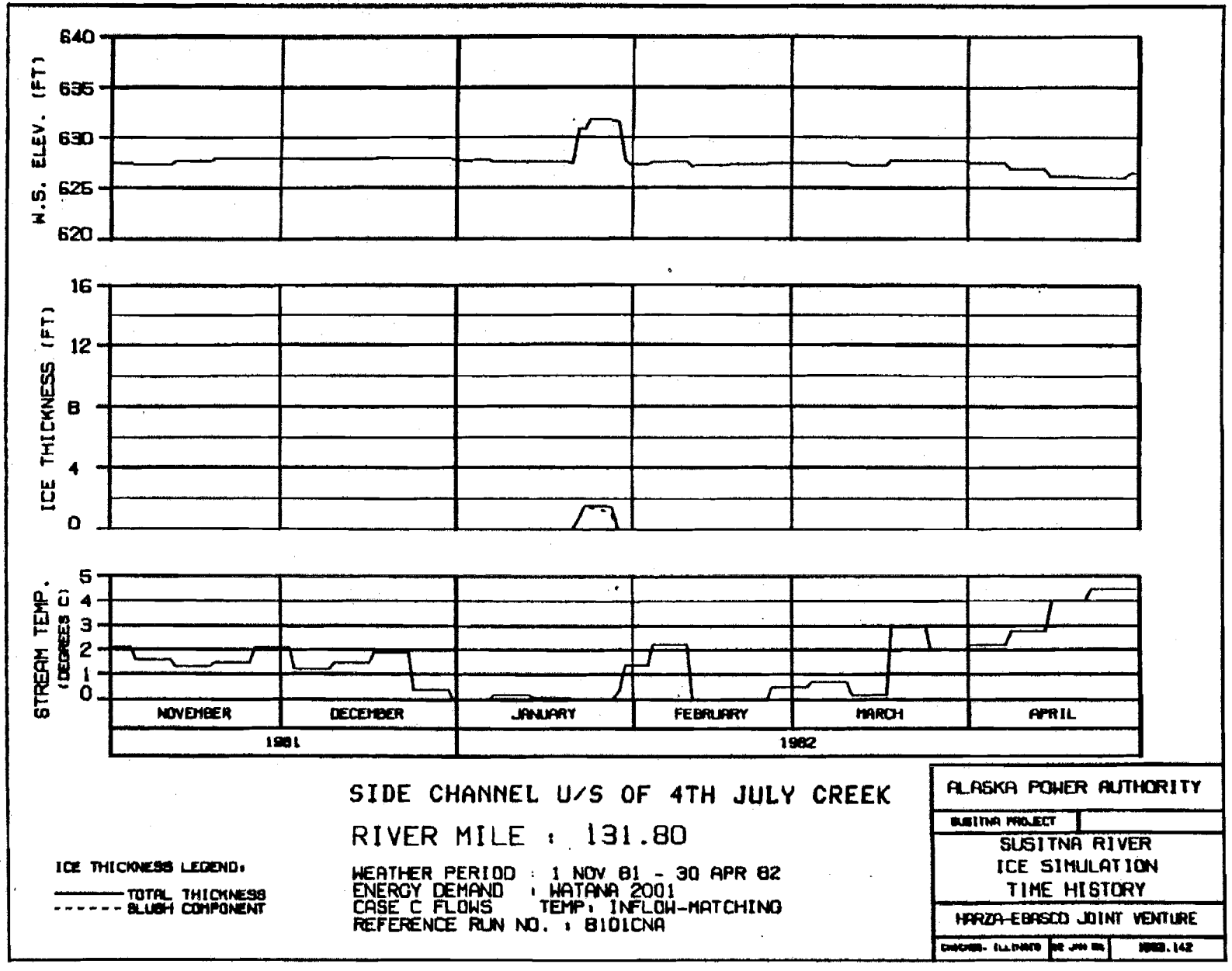
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | JAN 83 | 1588.142



SIDE CHANNEL U/S OF 4TH JULY CREEK

RIVER MILE : 131.80

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

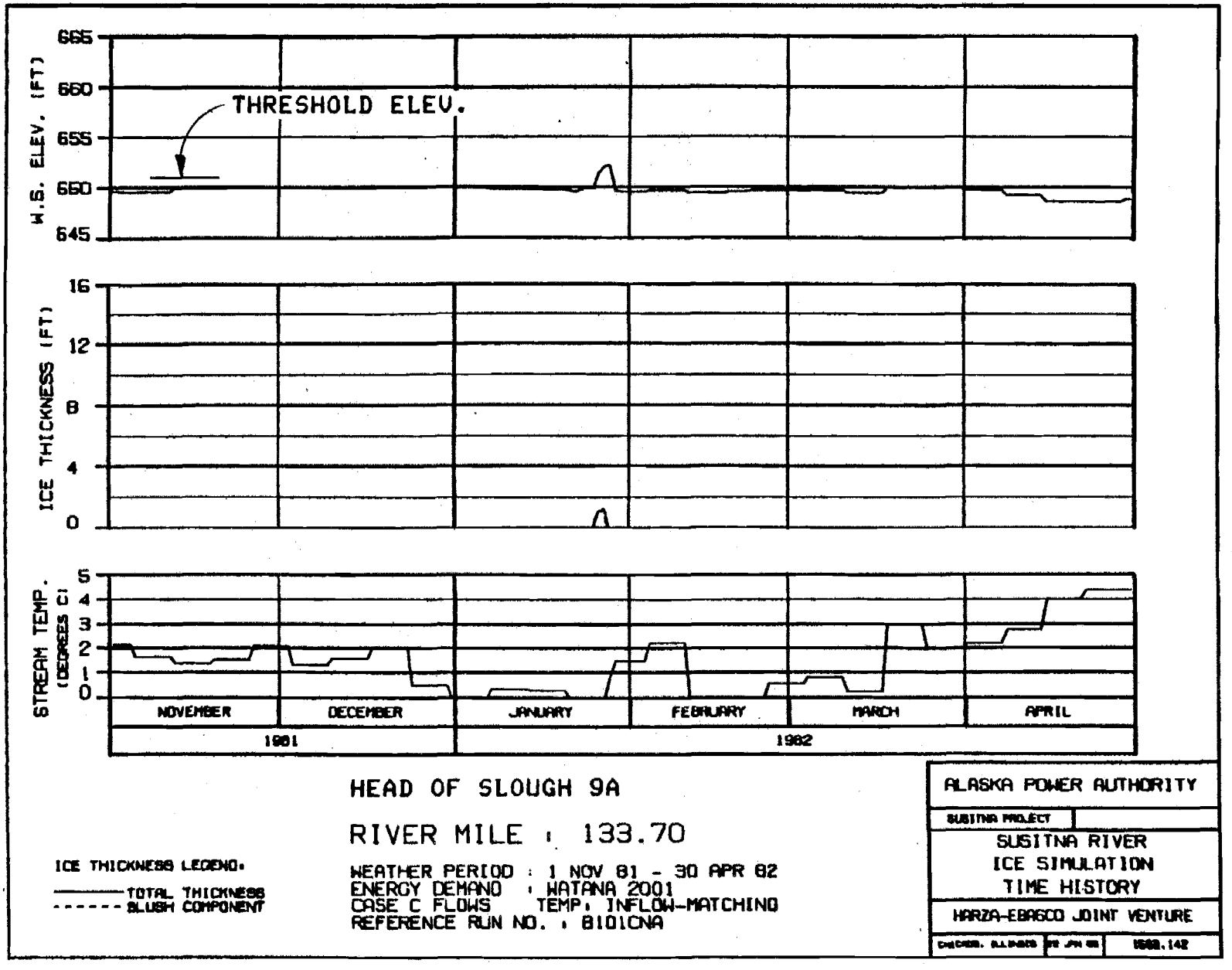
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | 22 JAN 88 | 1883.142



HEAD OF SLOUGH 9A

RIVER MILE : 133.70

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : B101CNA

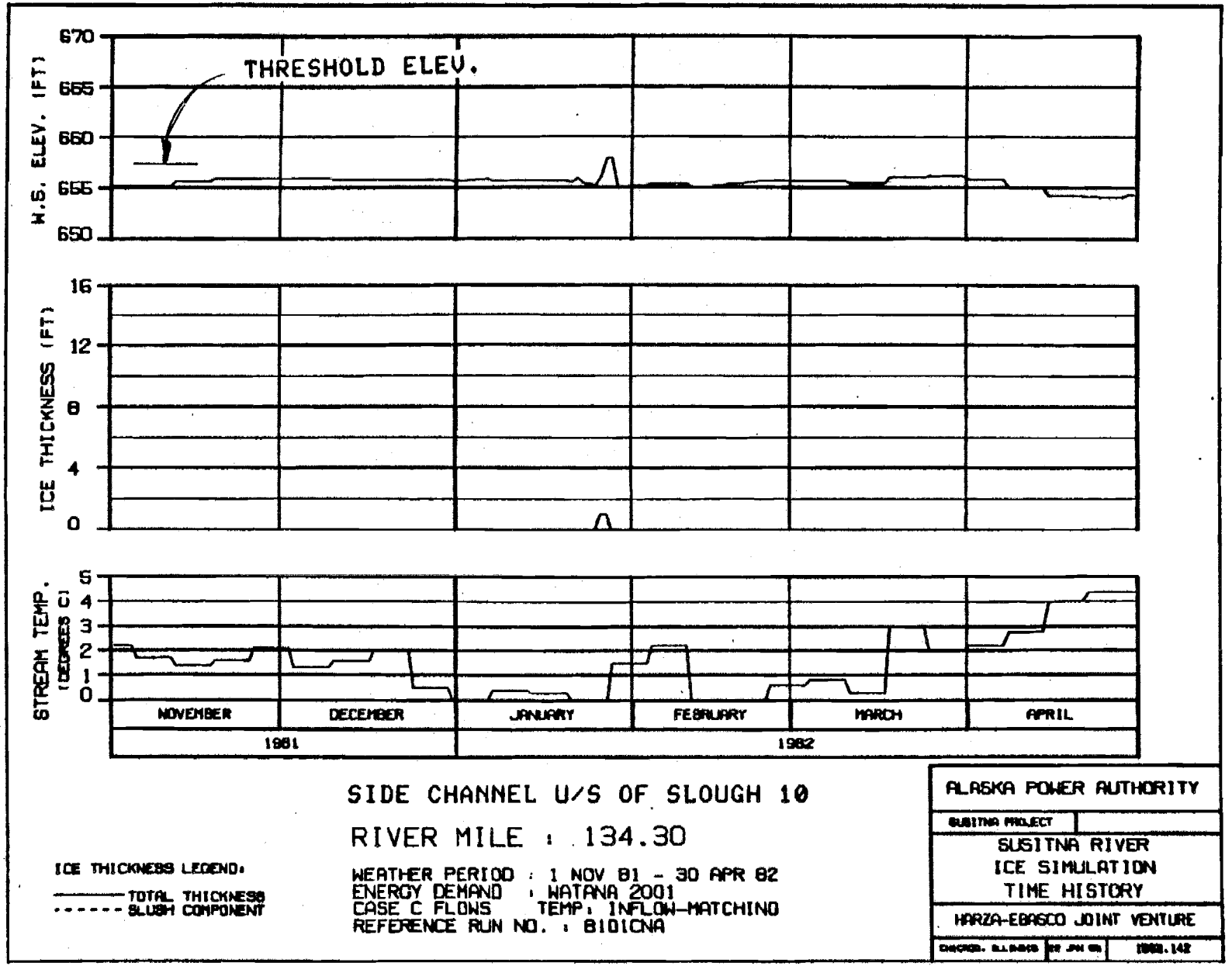
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

[illegible] 1988.142



SIDE CHANNEL U/S OF SLOUGH 10

RIVER MILE : 134.30

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81DICNA

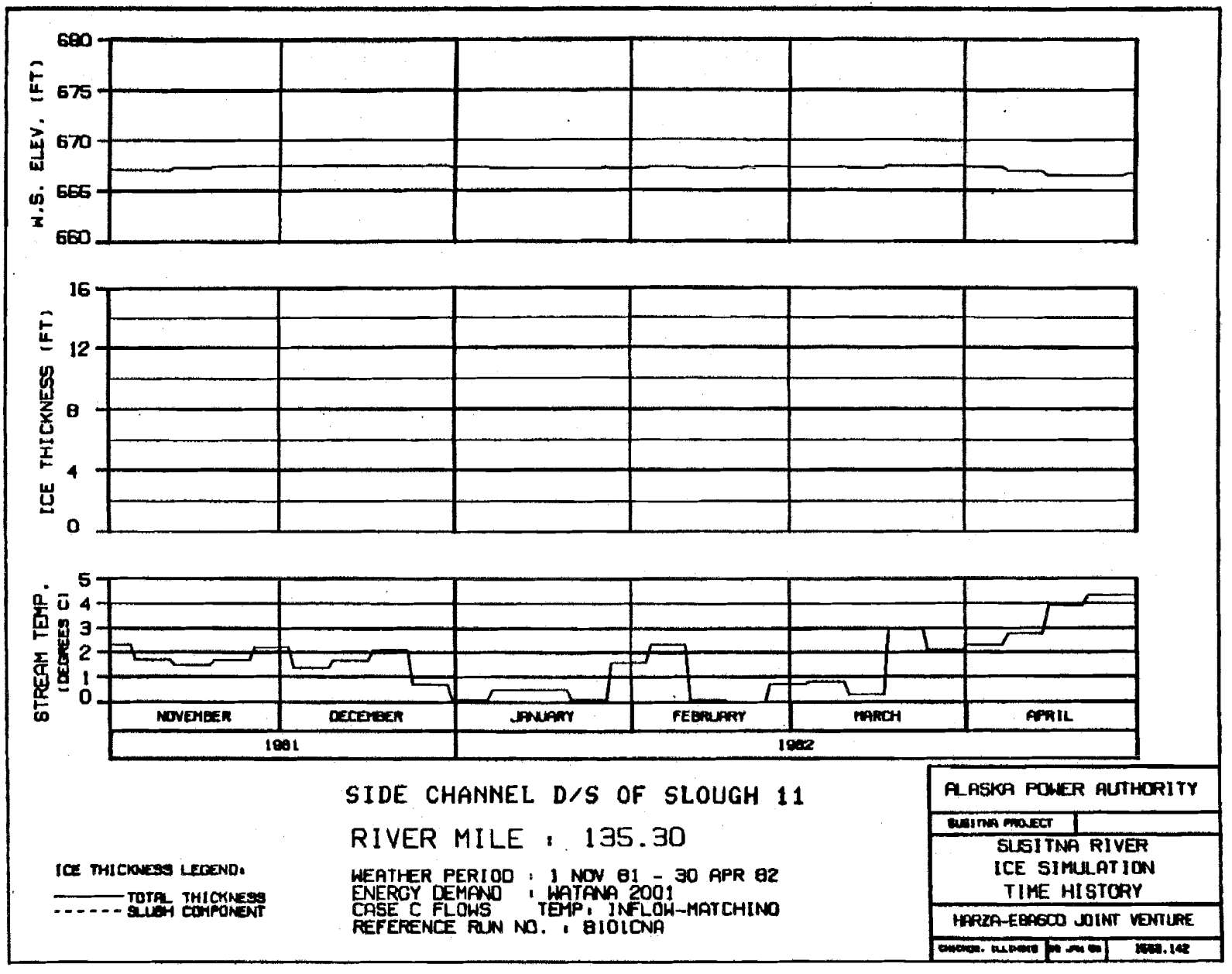
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

DWG NO. 1988.142



SIDE CHANNEL D/S OF SLOUGH 11

RIVER MILE : 135.30

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHINO
REFERENCE RUN NO. : 8101CNA

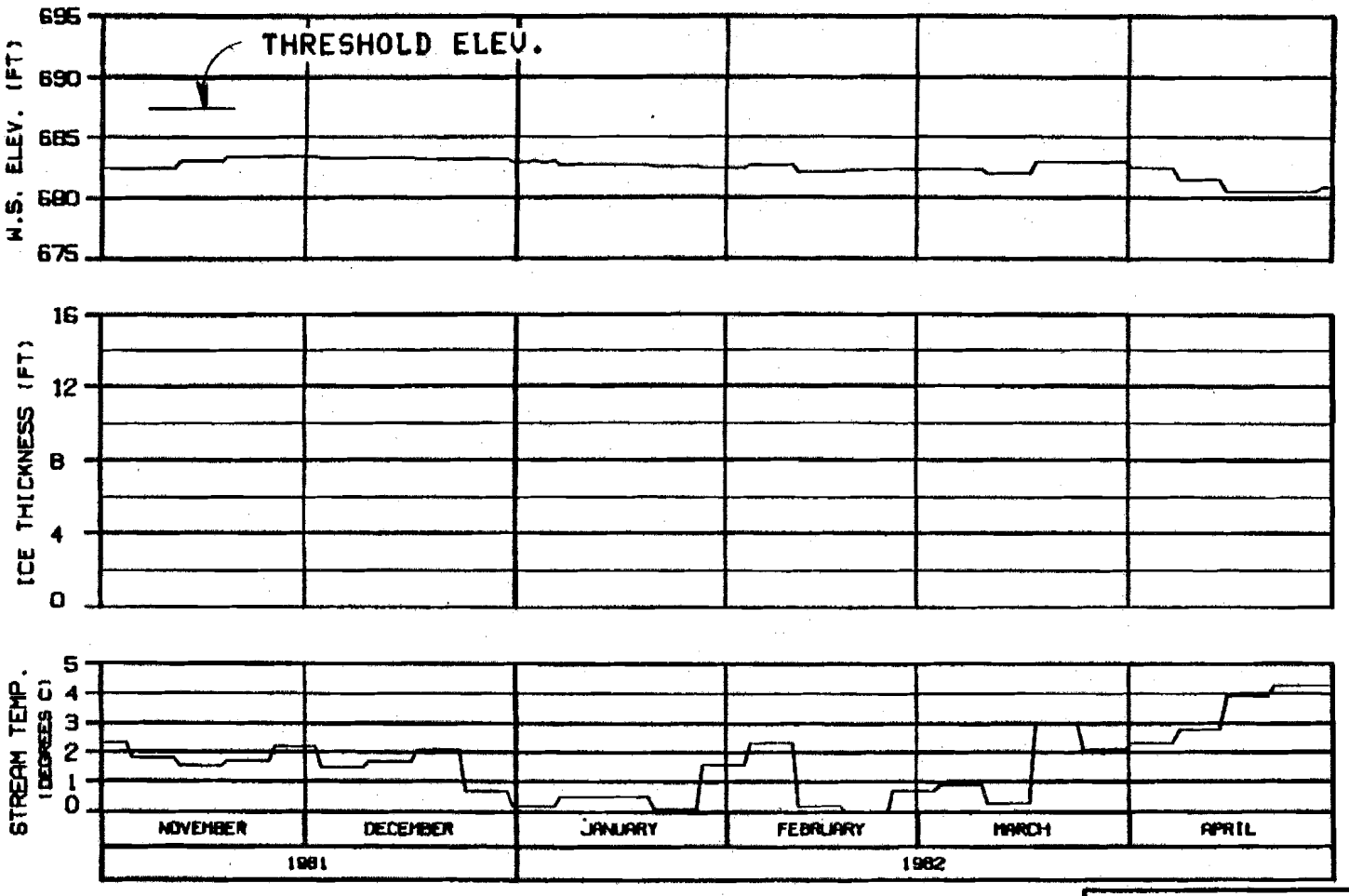
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHICAGO, ILLINOIS | JAN 88 | 1868.142



HEAD OF SLOUGH 11

RIVER MILE : 136.50

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81D1CNA

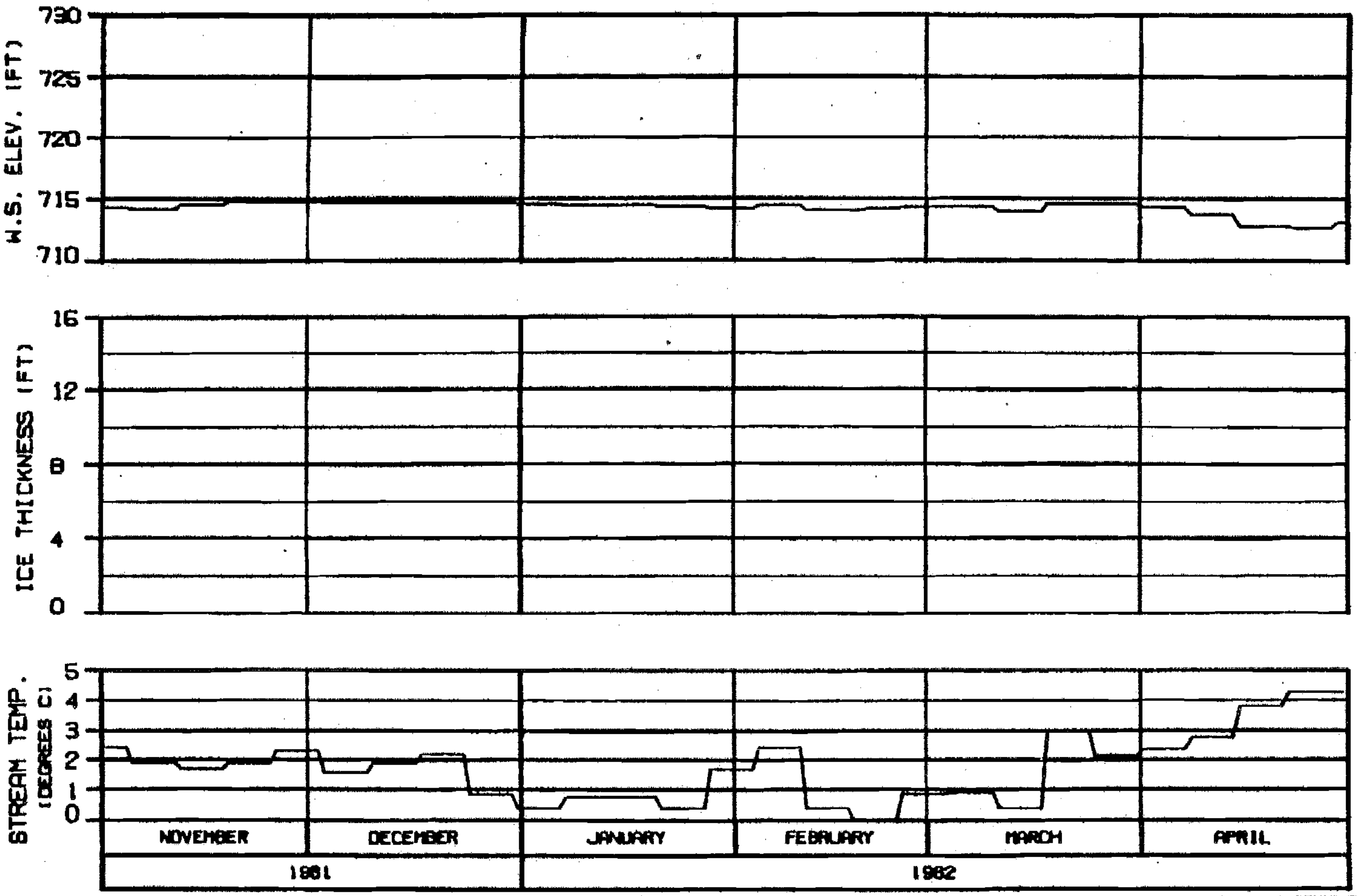
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

ENGRG. ILLINOIS | DR JAN 86 | 1868.142



HEAD OF SLOUGH 17

RIVER MILE : 139.30

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS
- - - - - - SLUSH COMPONENT

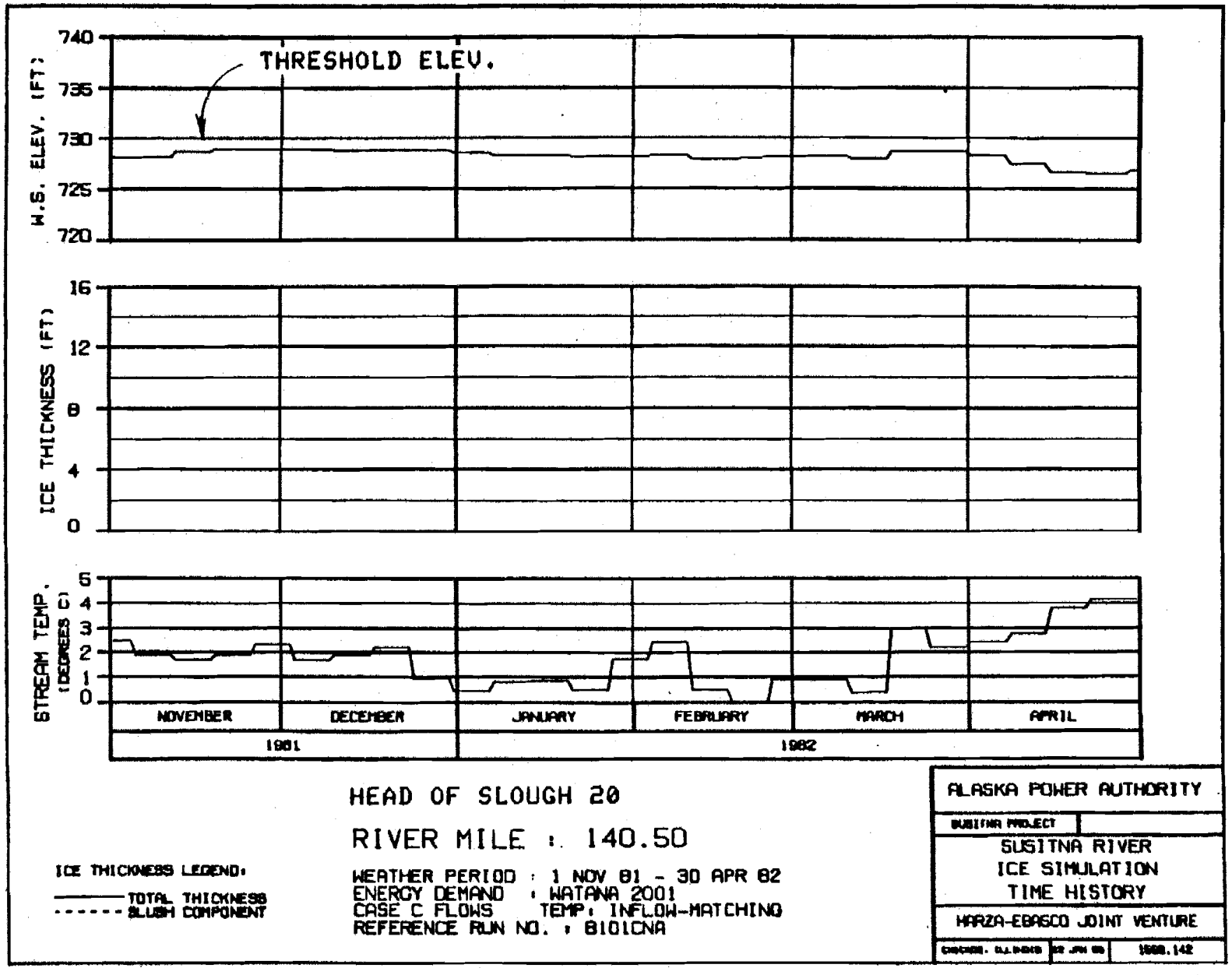
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

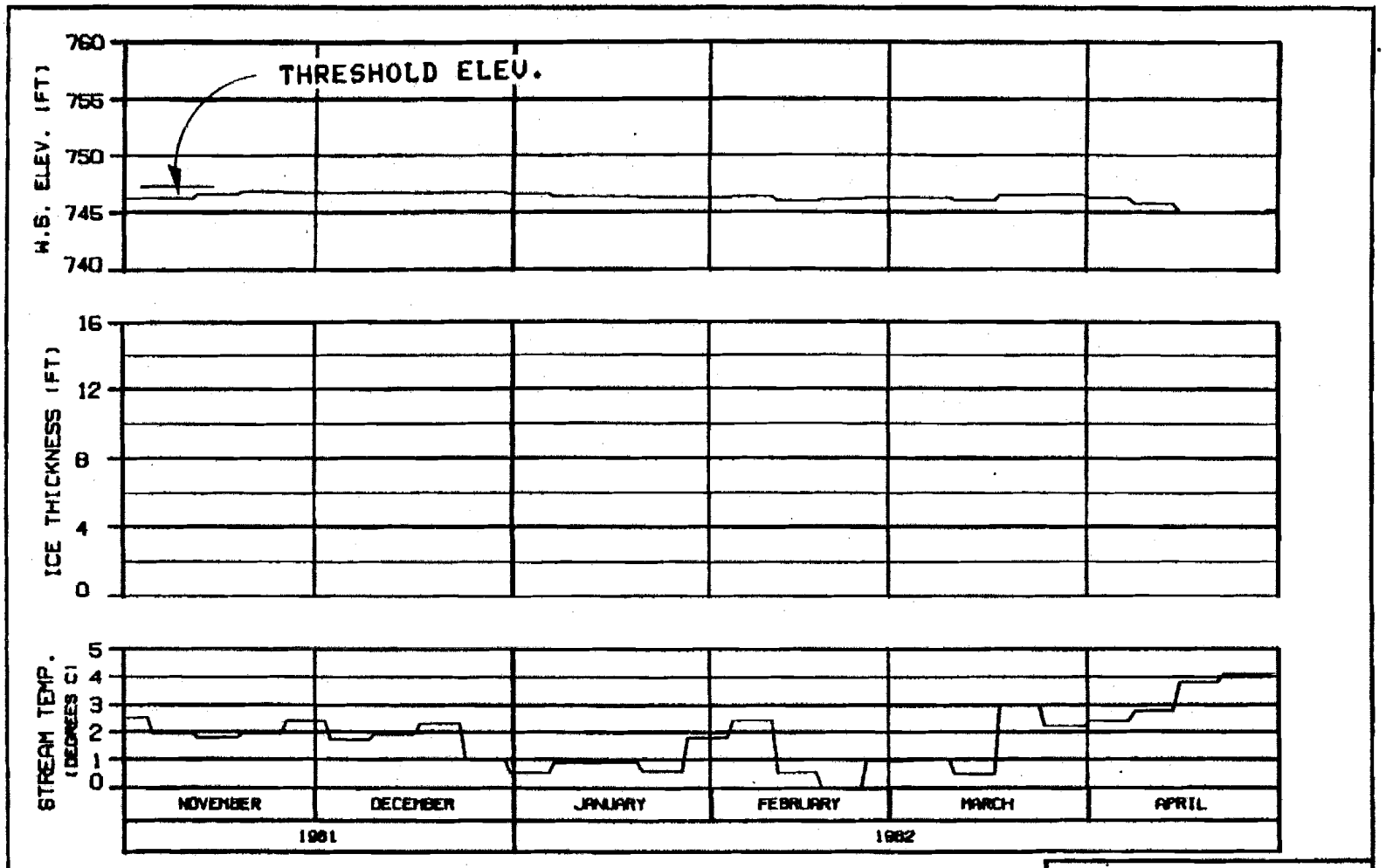
ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE


W.S. ELEV. (FT)
740
735
730
725
720
THRESHOLD ELEV.
ICE THICKNESS (FT)
16
12
8
4
0
STREAM TEMP. (DEGREES C)
5
4
3
2
1
0
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
1981
1982
HEAD OF SLOUGH 20
RIVER MILE : 140.50
ICE THICKNESS LEGEND:
TOTAL THICKNESS
SLUSH COMPONENT
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE



SLOUGH 21 (ENTRANCE A6)

RIVER MILE : 141.80

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 81D1CNA

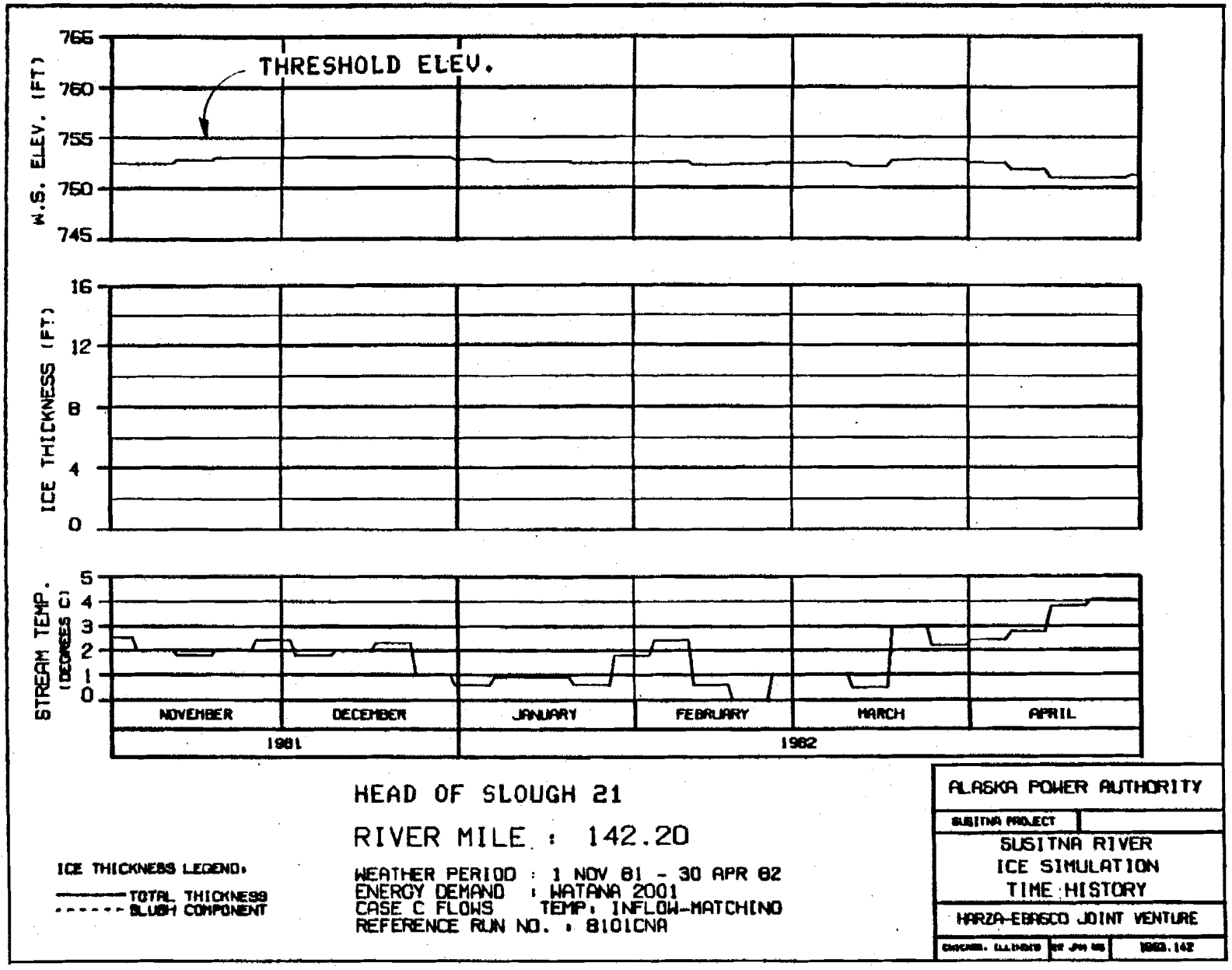
ALASKA POWER AUTHORITY

SUSITNA PROJECT

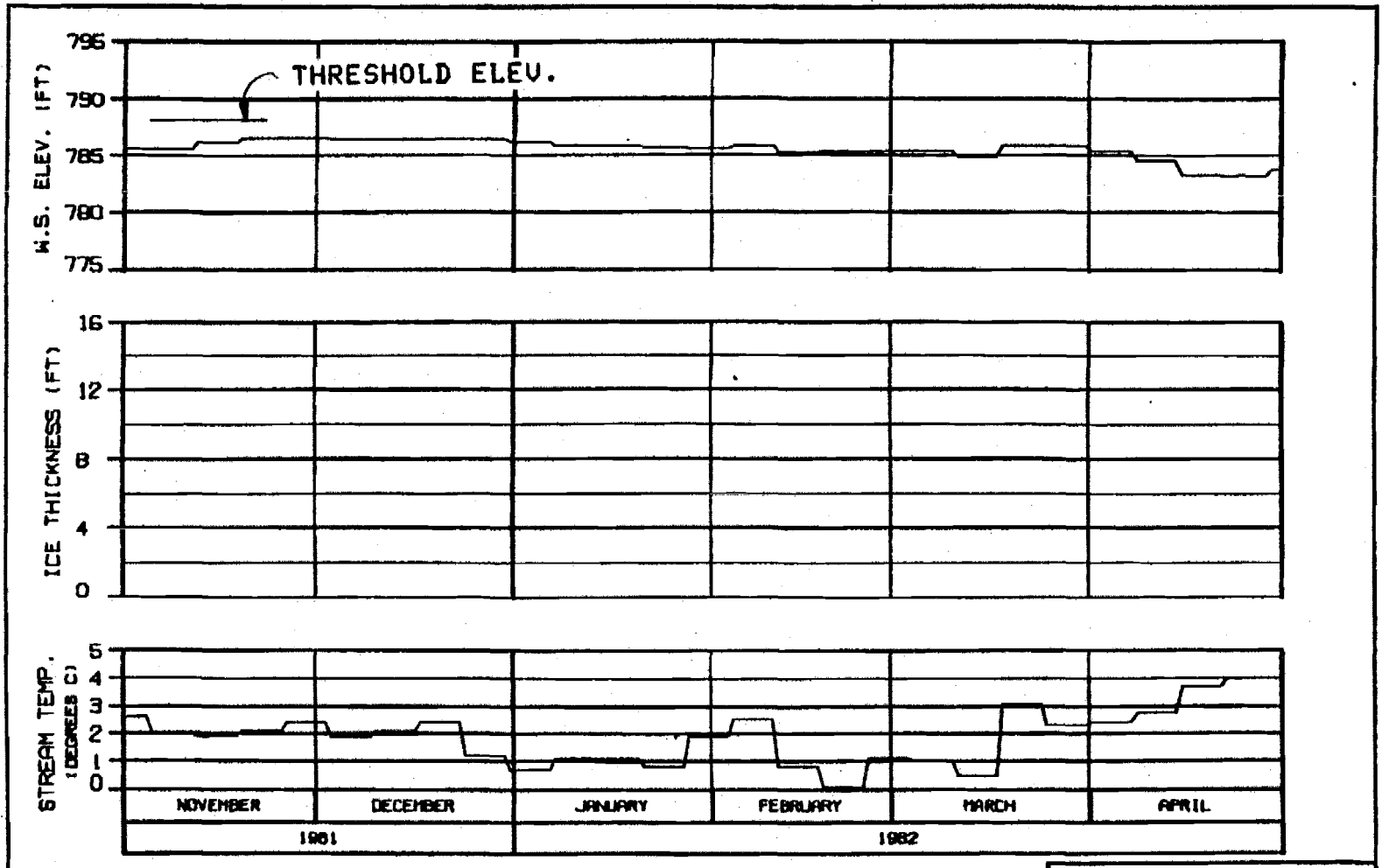
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

1568.142


W.S. ELEV. (FT)
765
760
755
750
745
THRESHOLD ELEV.
ICE THICKNESS (FT)
16
12
8
4
0
STREAM TEMP. (DEGREES C)
5
4
3
2
1
0
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
1981
1982
HEAD OF SLOUGH 21
RIVER MILE : 142.20
ICE THICKNESS LEGEND:
TOTAL THICKNESS
SLUSH COMPONENT
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
ICE SIMULATION
TIME HISTORY
HARZA-EBASCO JOINT VENTURE

C



HEAD OF SLOUGH 22

RIVER MILE : 144.80

ICE THICKNESS LEGEND:

——— TOTAL THICKNESS

- - - - - - SLUSH COMPONENT

WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
CASE C FLOWS TEMP: INFLOW-MATCHING
REFERENCE RUN NO. : 8101CNA

OPTION?

ALASKA POWER AUTHORITY

SUSITNA PROJECT

SUSITNA RIVER
ICE SIMULATION
TIME HISTORY

HARZA-EBASCO JOINT VENTURE

CHECKED: [illegible] 22 JAN 88 1668.142

Exhibit G-8

A COMPARISON OF RIVER ICE SIMULATIONS

FOR

CASE C AND CASE E-VI FLOW REQUIREMENTS

—

PROJECTED ENERGY DEMANDS FOR YEAR 2001

—

- Table of maximum water levels at significant habitat locations
- Comparison of discharges for Case C and Case E-VI
- Comparison of reservoir outflow temperatures for Case C and Case E-VI

Note: Simulations are based on hydrologic and meteorologic data from the period November 1981 to May 1982.

SUSITNA HYDROELECTRIC PROJECT
MAXIMUM SIMULATED RIVER STAGES
WINTER 1981-82 - WATANA ONLY OPERATION
"INFLOW MATCHING" RELEASE TEMPERATURES

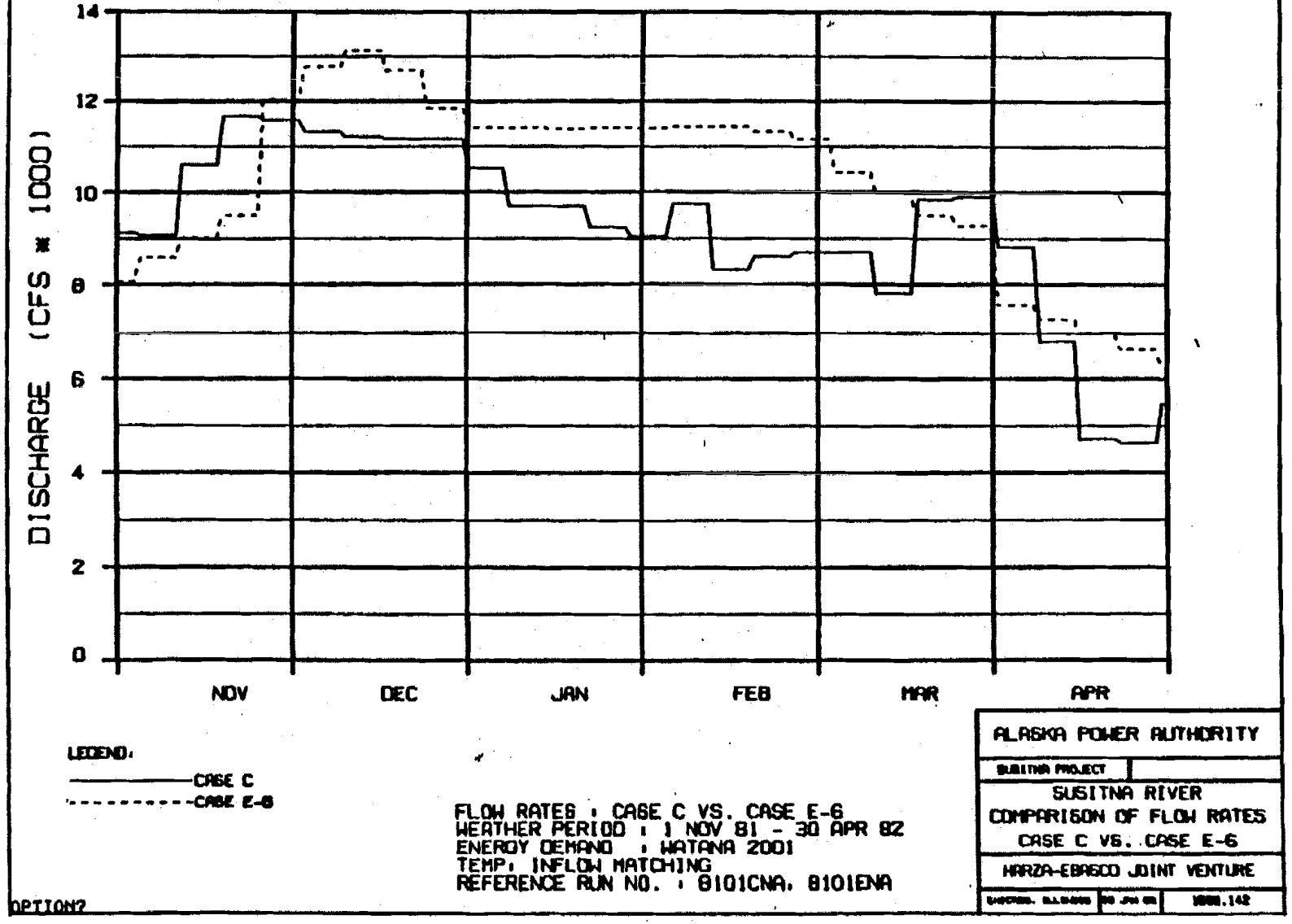
Slough or Side Channel	River Mile	Threshold Elevation	1996 Demand Flow Case C	2001 Demand Flow Case C	2001 Demand Flow Case E-6	
Whiskers	101.5	367	[371]	[371]	[371]	
Gash Creek	112.0	Unknown	460	461	458	
6A	112.3	(Upland)	462	464	460	
8	114.1	476	[477]	[477]	475	
MSII	115.5	482	[488]	[489]	[488]	
MSII	115.9	487	[491]	[491]	[490]	
Curry	120.0	Unknown	527	525	524	
Moose	123.5	Unknown	555	553	552	
8A West	126.1	573	[574]	[574]	[575]	
8A East	127.1	582	[585]	[584]	[585]	
9	129.3	604	[607]	[606]	[607]	
9 u/s	130.6	Unknown	620	620	621	
4th July	131.8	Unknown	631	632	633	
9A	133.7	651	[653]	[652]	[654]	
10 u/s	134.3	657	[659]	[658]	[660]	
11 d/s	135.3	Unknown	670	667	668	
11	136.5	687	[687]	683	684	max. upstream extent of ice front
17	139.3	Unknown	715	715	715	
20	140.5	730	729	729	729	
21 (A6)	141.8	747	746	747	747	
21	142.2	755	753	753	754	
22	144.8	788	787	787	787	

LRX-3 Ice Front Starting Date	12-28	12-30	12-28
Ice Front Reaches Gold Creek	1-27	---	---
Max. Ice Front Extent (River Mile)	137	134	134
Melt-out Date	4-3	4-3	3-23

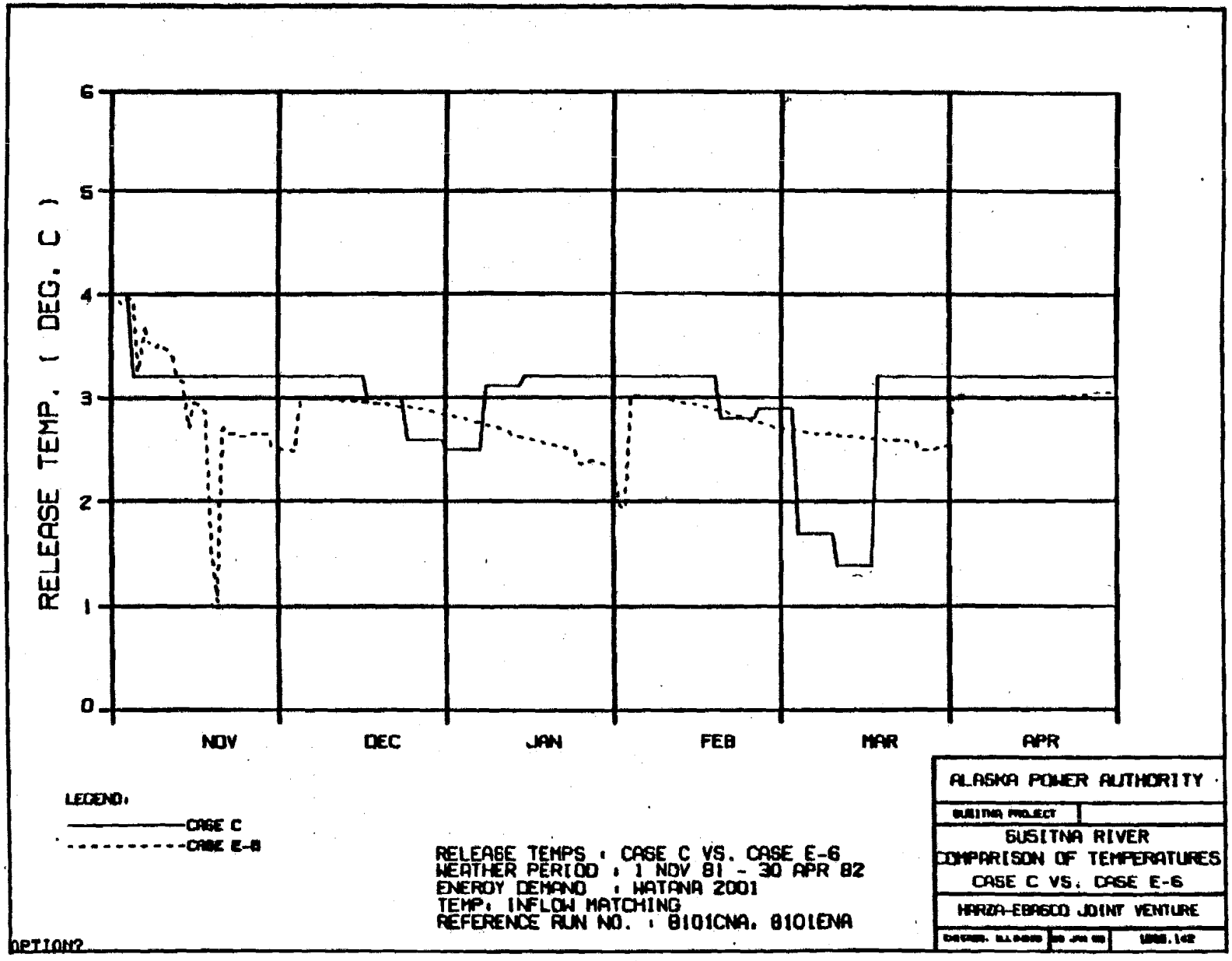
NOTES:

1. [ ] Indicates locations where maximum river stage equals or exceeds a known slough threshold elevation.
2. All river stages in feet.

C


DISCHARGE (CFS * 1000)
14
12
10
8
6
4
2
0
NOV
DEC
JAN
FEB
MAR
APR
LEGEND:
CASE C
CASE E-6
FLOW RATES : CASE C VS. CASE E-6
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
TEMP: INFLOW MATCHING
REFERENCE RUN NO. : 8101CNA, 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
COMPARISON OF FLOW RATES
CASE C VS. CASE E-6
HARZA-EBASCO JOINT VENTURE
1886.142
OPTION?

C


RELEASE TEMP. (DEG. C)
6
5
4
3
2
1
0
NOV
DEC
JAN
FEB
MAR
APR
LEGEND:
CASE C
CASE E-8
RELEASE TEMPS : CASE C VS. CASE E-6
WEATHER PERIOD : 1 NOV 81 - 30 APR 82
ENERGY DEMAND : WATANA 2001
TEMP. INFLOW MATCHING
REFERENCE RUN NO. : 8101CNA, 8101ENA
ALASKA POWER AUTHORITY
SUSITNA PROJECT
SUSITNA RIVER
COMPARISON OF TEMPERATURES
CASE C VS. CASE E-6
HARZA-EBASCO JOINT VENTURE

OPTION?